BULLETIN

OF THE

TORREY BOTANICAL CLUB.

Vol. III. New-York, January, 1872. **No. 1.**

1. **Blitum capitatum**, L.,—I have received from Delhi, Delaware Co., and hear that in that region it is not uncommon. I believe that it grows also in the neighborhood of Chester and Goshen, Orange Co., and I am very sure I have heard of its being found in Rockland Co. I have also heard of and seen it all the way from Rochester to Rome.

Blitum Bonus-Henricus, Reich.,—I have found at Blue Point, L. I., near Throgs Neck, and at other places in the S. E. part of Westchester Co. In Central and West N. Y. it is not at all uncommon. At Auburn, Aurelius, Clinton, Oriskany, and many other places I have seen it abundant. It loves the neighborhood of old wood piles, and corners of fences, and situations under the beams and around the posts of open sheds.

Salsola Kali, L.,—I have seen growing on the H. R. R. R. track, where it was daily passed over by the locomotives, all the way from Tarrytown to Sing Sing. It is quite common as far up the river as Tarrytown. I have often seen it growing in the interstices of timber wharves, high up above the water, where the wheels of carriages disturbed it continually.

Polygonum amphibium, L.—The two varieties grow larger in and on the shores of the outlets of the lakes of Western N. Y. than I have ever seen them elsewhere. On the shore of the Owasco Outlet the plant very frequently grows in a patch lying partly in and partly out of the water, all apparently the same in immediate origin. That growing on the shore and for a foot or two from the edge standing in the water is the Var. *terrestre*; then, beyond it, trails in the water the Var. *aquaticum*. I cannot believe that there is any thing permanent in the varieties, but am of the opinion that the same plant will change its form according to circumstances. There are also intermediate forms which it is hard to class under either variety.

Asplenium pinnatifidum, Nutt.—I learn that the Philadelphian locality of this plant is entirely destroyed, a new road or drive having just been blasted through by the Fairmount Park Commission. The fern grew in crevices on the steep sides of the cliff along the Schuylkill in the rear of Laurel Hill Cemetery. The taking off of the face of the cliff has entirely destroyed the locality and robbed Fairmount Park of its rarest plant. It is to be hoped that a few spores have made their way to some new crevice, and that the region may be replenished. Jan. 19th. I. H. H.

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2. Asplenium montanum, Willd.—Mr. Bower showed us recently a specimen of this fern, gathered by Mr. H. Denslow from the precipitous rocks that form the banks of Lake Mohunk, Paltz Point, Ulster Co., N. Y. Mr. Bower expects that *Aspidium fragrans*, Swartz, and *Asplenium montanum* may yet be found growing together in some common locality.

3. New Stations.—**Coronilla varia**, DC., grows luxuriantly a short distance north of Guttenburgh Brewery and not far from the river. It seems to be thoroughly established and naturalized, spreading in the open spaces of the wood. I first found it in 1869. G. M. WILBER.—**Limnanthemum lacunosum**, Griseb., Babylon, L. I. J. S. M.

4. Lace Lichen.—As some of our readers wished to have the correct name of this curious and beautiful plant, we applied to Prof. Tuckerman, from whom we received the following statement: "This lichen is one of the most remarkable of the characteristic species of the West Coast, where it is abundant. Its proper name is *Ramalina reticulata*, (Noehd.,) Krimpolh, but Menzies, who discovered it, called it (in herb.) *R. retiformis*, under which name I briefly referred to it in *Syn. Lich. N. Eng.*, 1848. Dr. Taylor had, however, called it *R. Menziesii* in *Hook. Jour. of Bot.*, 1847, and I published it, therefore, under this name in my *Lich. Amer. Sept.*, *No.* 57. But the name *Lichen reticulatus* is much older than either of these."

5. New Publications.—1. *Report of the Botanist of the New York State Museum of Natural History, Jan.* 1872.—Mr. Peck must have been very industrious, as he reports collecting "two hundred and ninety-nine species new to the State, and eighty-seven new to science, two of them representing two new genera"—a statement which implies a vast amount of labor, aside from the mounting specimens and the general care of the herbarium. He has, besides, received from others seventy-six additions to the flora of the State, and three of them new species. The plants new to science are of course the lower cryptogams, all of them, we believe, fungi, to which Mr. Peck and other botanists in the State seem to be more especially devoting themselves. Among the new species we notice as of interest to the Club, *Puccinia Gerardii*, Peck, and *Æcidium Allenii*, Clinton. Mr. Peck gives directions for poisoning and pressing fungi, derived from his experience, and also what appears to be a very useful synopsis of the difficult genera Clavaria and Æcidium. He finds in all sixty edible fungi in the State.

Credit is given to contributors for the plants sent, but justice would seem to require that the collector should he named as well, when his name accompanies the label. The keen eye of Dr. Allen detected *Wolffia* while he was riding on a stage coach among the Catskills; Mr. Denslow bequeathed specimens of *Galactia mollis* and *Commelyna Virginica* to the State Herbarium; and Messrs. Bower and Ruger discovered *Frangula* on Long Island, as has been reported in the Bulletin.

2. *Clarence King's Report of the Botany of the 40th Parallel* has been noticed by Dr. Gray in the *American Journal* for Jan., and we are promised a fuller review of this important contribution to

the North American Flora. It is published as No. 18 of the "Professional Papers of the Engineer Department, U. S. Army," under the direction of Maj.-Gen. A. A. Humphreys, Chief of Engineers. The botanist of the expedition was Sereno Watson, who, with the assistance in special orders of Prof. Eaton and others, is the author of this valuable report. There are many points of interest even to local botanists. The only one we have space to refer to is the doubt indicated whether *Lepidium intermedium*, Gray, is distinct from *L. ruderale*, L. In Vol. I., § 51, of the Bulletin we pointed out the resemblance of the embryos of the two forms, and the distinction that the cleft in the radical of *L. intermedium* was longer than in *L. ruderale*, so far as our specimens afforded an opportunity of judging.

3. The relations of botany to the earthly ring and to the zodiac may be read in *Hearth and Home* for Dec. 23d ult., and in the observations of the agricultural astrologist quoted in the Jan. No. of the *American Naturalist*.

6. **Financial.**—Subscriptions for 1872 are now due.

7. **Note on Catalogue.**—There is some uncertainty respecting the specific distinctions in *Amarantaceæ* and *Polygonaceæ*.

8. **Marsilia quadrifolia**, L.—As an acute Swiss naturalist has already discovered this plant in Fresh Pond, Cambridge, it is well to put it on record that the plant has been introduced there by Mr. Guerineau, our Gardener, and that it is becoming well established. The stock was originally from the American station, Lake Bantam, Litchfield, Connecticut, sent by Dr. Allen. ASA GRAY.

ATRIPLEX, Tourn.—**A. patula**, L. ; common ; N. Y. ; rare about Closter, very common in Orange Co., *Austin:* the more common Var. **hastata** ; everywhere about N. Y. : the nearest approach to Var. **littoralis**, I have found at Communipaw, *W. H. L.*—**A. arenaria**, Nutt. ; rather common on the shores adjacent to N. Y. ; Glen Cove, *Coles.*—The **A. rosea**, L., mentioned in the addenda to the Manual, is to be looked for in our streets.

SALICORNIA. Tourn.—**S. herbacea**, L. ; salt marshes, common, N. Y.—**S. Virginica**, L. ; Coney Island ; salt marshes, L. I., *State Flora.*—**S. fruticosa**, L.: Var. **ambigua** ; "New York, *Muhl.;* Long Branch, N. J., *Cooper*," *Torr. Cat.;* Glen Cove and Rockaway beach, *State Flora;* Coney Island, *Allen.*

SUÆDA, Forksal.—**S. maritima**, Dumortier ; common in salt marshes ; N. Y.

SALSOLA, L.—**S. kali**, L. ; common ; N. Y. ; Yonkers, *Pooley ;* Sing Sing, Tarrytown, *Hall.*

AMARANTACEÆ.

AMARANTUS, Tourn.—**A. paniculatus**, L. ; along the Kingsbridge road, near the upper end, or, at least, a form of Amarantus belonging to this section, with flowers strongly tinged with red, and numerous and rather slender spikes.—**A. retroflexus**, L. ; very common, with variations that need examination, one of which

usually passes for Var. **hybridus**; N. Y.—**A. albus**, L.; common; N. Y.—**A. pumilus**, Raf.; beach near Babylon, *State Flora.*—**A. viridis**, L.; streets of New York and Brooklyn (64th st. near 4th Ave., *O. W. M.*), sepals regularly five.—**A. Blitum**, L.; streets of N. Y., *O. W. M.*; Staten Island, Quarantine Landing; Weehawken, *W. H. L.*; Yonkers, *Pooley.*

ACNIDA, L.—**A. cannabina**, L.; common in salt marshes; certainly as far up the Hudson as Peekskill, *W. H. L.*; N. Y.

POLYGONACEÆ.

POLYGONUM, L.—**P. orientale**, L.; occasional in waste grounds on N. Y. Island, and in the surrounding districts.—**P. Careyi**, Olney; margin of a swamp between Tenafly and Cresskill, N. J., 1858, *Austin*; near Cooper's Glue Factory, Brooklyn, E. D., *Ruger*; Central Park, *R. & P.*—**P. Pennsylvanicum**, L.; common; Central Park, *R. & P.*—**P. incarnatum**, Ell.; borders of ponds, N. Y., *Torr. Cat.*, but not in State Flora, unless it be included under the next; *Le Roy.*—**P. Persicaria**, L.; very common; N. Y.—**P. Hydropiper**, L.; common.—**P. acre**, H. B. K.; common; achenium often lenticular, *Austin.*—**P. hydropiperoides**, Mchx.; not uncommon, *Torr. Cat.*, *Austin*; Staten Island and East New York, *W. H. L.*—**P. amphibium**, L.; Closter and Tenafly, *Austin*; Central Park, *R. & P.*: Var. **terrestre**, Willd.; English Neighborhood, *W. H. L.*—**P. Virginianum**, L.; common, N. Y.; about Tappan and Rockland it occurs with a distinct purple spot in the centre of the leaf, *Austin.*—**P. articulatum**, L.; frequent on Long Island and Staten Island.—**P aviculare**, L.; very common; N. Y.: Var. **erectum**, Roth.; common; N. Y.—**P. maritimum**, L.; both shores of Long Island.—**P. tenue**, Mchx.; common; N. Y.—**P. arifolium**, L.; common; N. Y.—**P. sagittatum**, L.; common; N. Y.—**P. Convolvulus**, L.; common; N. Y.—**P. cilinode**, Mchx.; Jackson Ave., near Dutch Kills, about 3 miles from Hunter's Point Ferry, *Ruger.*—**P. dumetorum**, L.: Var. **scandens**; common; N. Y.

FAGOPYRUM, Tourn.—**F. esculentum**, Moench; wood paths, fields, &c., frequent; N. Y.

RUMEX, L.—**R. orbiculatus**, Gray; Closter, *Austin*; Secaucus, East New York? *W. H. L.*; ("R. Britannicus, L."?) wet meadows, *Torr Cat.*; Central Park, *R. & P.*—**R. Brittanica**, L.; Hackensack meadows, between New Durham and Secaucus swamps, may be *R. salicifolius*, Weinmann, *W. H. L.*; Yonkers, *Pooley.*—**R. verticillatus**, L.; Little Snake Hill, *W. H. L.*—**R. crispus**, L; very common; N. Y.—**R. obtusifolius**, L.; quite common, but not reported from N. Y.—**R. conglomeratus**, Murray; Wading River, L. I., *Miller*, extra-limital.—**R. sanguineus**, L.; "meadows and pastures," *Torr. Cat.*, but not in State Flora.—**R. acetosella**, L.; very common; N. Y.

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Local Herbarium, 3, E. 33d St.—Editor, 224, E. 10th St

LAURACEÆ.

SASSAFRAS, Nees.—S. officinale, Nees; common; N. Y.

LINDERA, Thunberg.—L. Benzoin, Meisner; common; N. Y.

THYMELEACEÆ.

DIRCA, L.—D. palustris, L.; "shady woods, N. J.," *Torr. Cat.;* Tappan, *Austin;* Inwood, N. Y., *W. W. Denslow.*

SANTALACEÆ.

COMANDRA, Nutt.—C. umbellata, Nutt.; common; N. Y.

LORANTHACEÆ.

Phoradendron flavescens, Nutt., is said to have been seen near Elizabeth, N. J., and on Staten Island, but lacks confirmation. The *Arceuthobium* lately reported from the northern part of the State is to be looked for within our limits.

SAURURACEÆ.

SAURURUS, L.—S. cernuus, L.; common; N. Y.

CERATOPHYLLACEÆ.

CERATOPHYLLUM, L.—C. demersum, L.; common; N. Y., probably.

CALLITRICHACEÆ.

CALLITRICHE, L.—C. Austini, Engelm.; Closter, &c., common, *Austin;* Palisades, Staten Island, *W. H. L.*—C. verna, L.; common; N. Y. —C. heterophylla, Pursh; Closter, &c., common, *Austin;* Brooklyn Aqueduct, *Allen.*

PODOSTEMACEÆ.

PODOSTEMON, Mchx.—P. ceratophyllus, Mchx.; Paramus, &c., common, *Austin.*

EUPHORBIACEÆ.

EUPHORBIA, L.—E. polygonifolia, L.; common; N. Y., *Torr. Cat.*—E. maculata, L.; common, N. Y.—E. hypericifolia, L.; common; N. Y.; E. marginata, Pursh; rarely escaping from cultivation.—E. corollata, L.; Monmouth Co., N. J., *W. H. L.;* Staten Island, *Le Roy.*—E. Ipecacuanhæ, L.; Long Island, *State Flora;* Woodhaven, *Ruger;* Staten Island, *Le Roy;* South Amboy, &c., common.—E. Cyparissias, L.; escape, Chatham, N. J., *W. H. L.;* Closter, &c., *Austin;* Flatbush, *Ruger.*

ACALYPHA, L.—A. Virginica, L.; common; N. Y.: Var. gracilens, common; N. Y.—A. Caroliniana, Walt., Ell.; Princeton, N. J., *Torrey in Gray's Man.;* Closter, *Austin.*

EMPETRACEÆ.

COREMA, Don.—C. Conradii, Torrey; between Oyster Bay and Hempstead, *Emmons in State Flora;* Mr. Coles, of Glen Cove, writes that he has "sought it very generally in Queens and Suffolk Counties, in the most likely places, without ever finding a single specimen."

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URTICACEÆ.

ULMUS, L.—U. **fulva**, Mchx.; Palisades; Glen Cove, *Coles;* Central Park, *R. & P.*—U. **Americana**, L.; common; N. Y.—U. **campestris**, L.; in abandoned grounds.

CELTIS, Tourn.—C. **occidentalis**, L.; not uncommon; N. Y.; Glen Cove, *Coles;* Weehawken, abundant; Closter, scarce, *Austin;* North Salem, *Mead.*

MORUS, Tourn.—M. **rubra**, L.; Bloomingdale, *Torr. Cat.;* Chatham, N. J., *W. H. L.*; Glen Cove, *Coles;* Closter, scarce, *Austin;* Hoboken Heights, *Ruger;* Central Park, *R. & P.*—M. alba, L.; rather common about the city, 86th Street, Astoria, Hoboken, etc., *W. H. L.*; Central Park, *R. & P.*

9. Herbarium Suggestions.—No. 5. *Poisoning Plants.*—All phænogamous plants, at least, are not only liable to be attacked by insects when in a dry state, but are pretty sure to be thus destroyed in time if not properly protected. The ferns appear to be mostly free from this danger, and it is not considered necessary to poison a specimen of a fern, unless it be extremely rare.

For poisoning we use a solution of corrosive sublimate in alcohol, about one ounce of the sublimate to a quart of alcohol; or the strength may be tested by dipping a black feather in the solution, which should not be strong enough to whiten the feather when dried.

Now there is one precaution with regard to the use of this solution, which sad experience leads me to insist upon at the outset:—corrosive sublimate acts upon all metals in common use, and forms a dark compound which stains anything with which it comes in contact. Hence this solution should never be kept in a metallic vessel, nor be applied with a brush having a metallic ring; and all metals should even be avoided in every process to which the specimen is subjected after poisoning, as, for instance, in gluing.

To illustrate this danger, I will say that I once employed a person to glue a large lot of valuable plants, which I had poisoned, to my herbarium sheets. Aware of the danger referred to, I had provided a glue-pot lined with porcelain, although made of iron. When the job was done, I found, to my disgust, that the sheets of paper were ruined by dark stains in almost every part, and the specimens had to be soaked off and reapplied to fresh sheets. Upon examining into the cause, I found that the porcelain lining of the pot had chipped off in places, exposing the iron; the glue-brush, alternately dipped in the glue and then applied to the poisoned plants, had brought the sublimate and the iron together, and the unsightly color had been distributed wherever the plants or the towel used in pressing them down had touched the white paper.

The solution of corrosive sublimate having been prepared, the specimens may be either immersed or sprinkled. With valuable plants, I have sometimes poured the solution into a large, shallow, dinner plate, such as is used for joints, and immersed the whole specimen for a second therein.

It is usually sufficient, however, and it is far more convenient to

apply the solution by sprinkling ; and the application need be made in the tougher specimens only to the more tender parts of the plant which are especially exposed to the attacks of insects—I mean the flower itself, including the receptacle, the buds, and the younger shoots ; thus the axils of the branches should receive special attention.

The accompanying wood-cut represents the most convenient bottle for this application. It will be noticed that it is different in construction from the ordinary "drop-bottle," and does not require any blowing with the mouth through one of the glass tubes, but needs only to be inclined at an angle to discharge a fine stream of the solution wherever desired. D C is the tube through which the fluid escapes ; A B, the tube through which the air enters to supply the place of the escaping stream. The bottle should be filled only to the line f e, below the lower opening of the tube A B, otherwise on inclining the bottle the fluid will flow into this tube and obstruct the entrance of air. When such a bottle is ordered of a glass-blower, unless minute directions are given, he will think you want an ordinary chemist's drop-bottle and will reverse the lengths of the tubes. The extremity C of the discharge tube should be drawn to a very fine point.

After poisoning specimens they are to be laid between driers and placed under a light weight for twenty-four hours, when, as the alcohol is quickly absorbed or evaporated, they will be found to be sufficiently dry. F. J. B.

10. **Notes by Mr. Bower.**—The new station of *Asplenium montanum*, Willd., is very much more north than any before mentioned. I have a specimen from Lancaster Co., Penn., but believe it has not yet been reported from New Jersey. It is curious that this species should make such a leap north. *Aspidium fragrans*, Swartz, has been found at Bellows Falls, N. H., and among the Adirondacks, and perhaps a time may come when both may be found growing together. They are plants of similar habits in not producing runners, and, although individual roots may increase so that several plants may be made of one, the natural way of both is to multiply by spores.

The subject of the two modes of multiplication of plants is interesting. Those with running roots do not seed freely. In my garden *Lygodium palmatum*, Swartz, creeps along and now occupies the sod of a bed about 12x24 inches, which is a little lower than that adjoining, but I do not see any seedlings. While young plants of *Aspidium Goldianum*, Hook., and *A. cristatum*, Swartz, var. *Clintonianum*, are frequent in my place, I see no seedlings of *Asplenium thelypteroides*, Mchx ; it increases enough the other way.

Struthiopteris Germanica, Willd., has a habit peculiar in sending

out runners two or three inches under the surface, and to a distance of 12 to 20 inches, where a young plant springs up. For this piece of generosity on its part, I have planted it alone, away from other ferns, where its ropy runners may be removed without danger of disturbing other things.

Other plants that produce seedlings with me are *Jeffersonia diphylla*, Pers., some Trilliums, and I see young plants of *Agave Virginica*, L. *Asclepias verticillata*, L., is almost a weed, coming up through the tan in the walks. I should say that the different beds that contain the above-named plants are not common garden soil, but made with much trouble from leaf mould and soil brought from the woods.

There is much difference in plants in adapting themselves to circumstances. *Frangula Caroliniana*, Gray, grows well in common soil, while *Epigœa repens*, L., will not be suited anywhere. I cannot keep *Cypripedium acaule*, Ait., although I have seen it in nearly pure dry sand and in wet sphagnum. It is curious that *C. acaule* has only one bud to each plant. It is the only one with a divided lip, and of our species the only one without a leafy stem. W. B.

11. **Rhus Toxicodendron**, L.—While riding in Chester Co., Penn., near the Delaware State Line, I saw a cow on the bank of the road, three or four feet higher than the roadway, nibbling this plant which grew in the hedge. On my return I enquired of a farmer if cows were known to eat the poison vine. He said he had known such cases, but whether it had any effect upon the milk he did not know.

Some years ago I wished to get *Rhus toxicodendron*. I was informed that the difference between that and *R. radicans* was, that the latter had entire leaves, while the leaves of the other were notched. I have found *R. radicans* at Bloomingdale having entire and notched leaves on the same branch. Subsequently I supposed that aerial rootlets might be a distinction, but I found on the rocks at Bergen Heights *R. radicans* growing up the face of the rocks, the main stem well fastened to the rock by the rootlets, and at the height of six or eight feet from the ground giving off a horizontal branch of several feet in length, and perfectly free from rootlets.

I have seldom found the climbing kind on trees of any height in swamps ; there it is more likely to be bushy, or growing on stumps.

J. T. S. S.

12. **Financial.**—Our expenses for the first two volumes exceed our receipts $53.33. There are about $26 due which will probably be paid. As our small mail, if unpaid, must be delivered at the General Office in the city, we have not always leisure to forward it. Those who wish it can insure a more prompt despatch by inclosing to us twenty cents for the remainder of the year. The last number was vexatiously delayed by difficulties in the mailing.

13. **Oaks and Willows.**—We want precise information about the local distribution of these Orders.

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NEW HEPATICÆ, by C. F. Austin.

1. **Sarcoscyphus Bolanderi**, Austin.—S. pusillus, dense intricate cæspitosus, nigricans, rufo-fuscus et lurido-viridis; caule repente vel apice adscendente 1–3 lineas longo valde radiculoso innovando-ramoso et ex apice prolifero-continuo clavato eflagellari; foliis inferioribus distantibus caule parum latioribus subverticalibus patulis, superioribus imbricatis valde majoribus subdistichis erecto-patentibus, omnibus ovato-rotundis (magis latis quam longis) obscure marginatis margine paullulum repandis apice ¼–⅓ emarginato-bilobis, sinu acuto seu obtusiusculo, lobis plerumque valde obtusis, areolis distinctis pro genere maximis subconformibus subrotundis confertis subobscuris crassis, intercalaribus valde angustis obscuris; fructu———.

Hab. On exposed rocks, in the mountains of California, *Bolander* (1865).

S. Bolanderi in size about equals the European *S. adustum* (*Sarcoscyphus adustus*, Nees), and is remarkable chiefly for its leaf-cells being the largest of the genus, for the broad leaves being extremely variable in their position (either erectish or widely spreading or even somewhat recurved, and nearly plane or very concave or subcomplicate on the same stem), and for its very long numerous and delicate rootlets.

S. adustus has the lower leaves somewhat appressed, acutely lobed, and (except the very lowest ones) closely imbricated · and the areolation (about as in *S. Funckii*) is much smaller.

2. **Sarcoscyphus Boeckii**, Austin.—S. valde minutus intricato-cæspitosus læte viridis; caule substricto fragili filiforme (fertili elongato-clavato, sterili ob folia perigonialia interrupto) innovandi-ramoso proliferove eradiculoso? eflagellari? subsemiuniciali; foliis caulinis valde distantibus distichis erecto-adpressis ovatis pellucidis bifidis, sinu lobisque acutissimis, margine sæpe scariosa, areolatione *S. Funckii*, involucralibus exterioribus sensim auctis ratione latioribus subimbricatis, interioribus duplo (quam exterioribus) majoribus in urceolam minutam oblongo-campanulatam fere ad apicem connatis, apice subrecurvo acute emarginato (lobis valde acutis); perianthio delicatissimo semiconnato involucro fere æquilongo; capsula globosa; foliis perigonialibus valde majoribus semi-globoso-concavis imbricatis brevius emarginatis, lobis sæpe obtusis; perigoniis (2–3) magnis longiuscule stipitatis.

Hab. With *S. densifolius* and *Alicularia scalaris*, in the Norwegian Alps, Prof. *Bœck* (1869).

S. Boeckii is remarkable for its very minute size (about like *Jungermannia divaricata*), distant appressed and very acutely lobed leaves; the involucral ones connate nearly to the subrecurved apex, the perigonial abruptly much enlarged, etc.

The leaf is rather more deeply and acutely bifid, but its shape and texture, and the shape of the fertile stem are almost precisely as in *Gymnomitrium concinnatum*.

S. Funckii is a much larger species, with imbricated slightly se-

cund leaves, which are not appressed to the stem, and are somewhat obtusely lobed; the involucre is larger, and shorter in proportion to its size; its leaves are connate only at the base, and have their obtusely lobed apex subincurved or straight, the outer ones much larger and convolute; perianth much shorter than the involucre, and connate only at its base; capsule smaller in proportion, etc.

3. **Scapania Oakesi**, Austin.—Sc. foliis obovatis subpatentibus (sæpe deflexis) convexis arcte complicato-bilobis obtusis serrato-dentatis, lobo dorsali dimidio minore subrotundo minutius dentato, superioribus (præsertim involucralibus) duplo majoribus grossius dentatis margine versus basin carinaque saturate purpureis dentibus valde majoribus calcariformibus (curvatis) armatis; perianthio breviusculo oblongo fere a basi ad apicem leniter recurvo, ore truncato dentato; antheridiis cum paraphylliis (ut sæpe in *Sc. nemorosa* inventa sunt) immixtis.

Var. α. Caule erecto 2–3 unciali ex apice prolifero eradiculoso nonnunquam e ventre flagellari (flagellis brevissimis) toto longitudine æque folioso; foliis obovatis vel subtrapezoideo-rotundis basi saturate cæteroquin pallido-purpureis; inflorescentia dioica; foliis perigonialibus valde minoribus oblongis inflatis margine superiore ad basin calcaratis.

Var. β. Perianthio longiore fusco-purpureo; foliis longioribus oblongo-obovatis vel subcuneatis subdimidiatis haud vel minus patentibus basi margineque saturate purpureis cæteroquin viridibus, inferioribus magis minusve sphacelatis; inflorescentia monoica; foliis perigonialibus haud brevioribus latioribus magis imbricatis basi excavatis.

Var. γ. Caule brevi (circa $\frac{1}{2}$–$\frac{3}{4}$-uniciali) basi decumbente valde radiculoso; foliis magis æqualiter bilobis fere toto læte viridibus, carinæ dentibus minus calcaratis; perianthio breviore apice latiore subplicato, ore inciso-ciliato; perigonialibus ut in Var. β.

Var. δ. Caule radiculoso; foliis minus dentatis, inferioribus sæpe carina calcaratis, superioribus minus auctis carinæ dentibus minoribus; perigonialibus haud visis.

Hab. Var. α and β, in the region of the White Mountains of New Hampshire, *Oakes*. Var. γ, in the Lake Superior region, Canada, *Macoun*. Var. δ, Observation Inlet, Columbia, Oregon, *Dr. Scouler* in Herb. Torrey.

8. **Oakesi** appears to be very closely allied to *S. undulata*, Var. *purpurea*; but is readily distinguished by the large spur-like teeth, on the carina of the uppermost leaves.

4. **Jungermannia crenuliformis**, Aust., *Hep. Bor. Amer. Exsic. ined. No.* 31.—J. examphigastriata, dense lateque cæspitosa, fusco vel miniato rufescenti-viridis; caule fertili repente substricto simplici sursum increscendo (radiculis plerumque purpureis) valde radiculoso, sterili subadscendente graciliore sursum decrescendo; foliis orbiculatis cellulis confertioribus crassioribus parum majoribus subquadratis marginatis valde concavis (siccatis ob marginem valde

constrictam fere cupulatis) leniter repando-undulatis integris vel subemarginatis e basi radiculigera subventricosa et subappressa oblique patentibus (ad caulem valde oblique insertis) parumper decurrentibus, in caule sterili etiamnum magis concavis distinctius marginatis erecto-verticalibus; perianthio parvo subovato cum involucri foliis plus minusve connato haud vel parum exserto basi radiculoso primum apice subtriquetro acutiusculo et a lateribus subcompresso, uno latere plano vel 1–2- altero 3(–5)-plicato, demum teretiusculo atque apice subrostelliforme, plicis omnino bistriolatis; capsula ovali-globosa; calyptra sæpe violacea.

Hab. On rocks along rivulets, near Closter, N. J.; associated with *Jung. pumila*, With., and *J. fossombronioides*, Aust.; also in Coschocton County, Ohio, *Sullivant.*

Allied to *Jungermannia crenulata*, Smith; but more robust and densely cæspitose; leaves much more concave (when dry almost cup-shaped), composed of smaller cellules, less strongly margined, much more obliquely attached to the stem, and never appressed; color never red; perianth smaller, the angles not keeled, etc.; besides, the habitat is different.

Very distinct from *Alicularia scalaris* in the want of amphigastria, in the less crowded more spreading much less emarginate leaves, etc.

Cells of the leaves subrotund or suboval, obtusely angular, somewhat enlarged but scarcely elongated towards the base; those on the constricted margin (one or two somewhat interrupted rows) more or less quadrate and crowded, and often becoming whitish by age.

On account of the straightish simple stems, and strongly concave leaves (with a constricted margin), the sterile plant has a striking resemblance to some forms of *Sphagnœcetis communis*, Nees.

Mode of growth much as in *Jung. fossombronioides;* but smaller, and with a differently shaped perianth, etc.

5. Jungermannia Wattiana, Aust.—J. caule crassiusculo 2–4 lineas longo fragili subflexuoso arcuato subintricato valde radiculoso, gemmiparo spiciformi; foliis erecto-subverticalibus subpatulisve subovatis concavis emarginato-bilobis, inferioribus lobis plerumque acutis, superioribus acutis obtusisve sæpe apiculatis incurvisque, sinu lunulato angulatove, areolis subrotundis majusculis; amphigastriis subobsoletis valde difformibus plerumque ex ovato subpiliformi-acuminatis in subulatam transeuntibus margine hic illic ciliato-appendiculatis apice incurvis; perianthio terminali parvo inflato lageniformi-ovato, apice (contracto) albido, ore ciliato; involucri foliis parum majoribus subundulatis minus profunde bilobis; colore fusco-viridi vel brunneo.

Hab. On the ground; associated with *Sphagnœcetis Macounii*, *Scapania brevicaulis*, etc., in the Lake Superior region, Macoun, (1869). Communicated by D. A. P. Watt, Esq., of Montreal, Canada.

About the size of *J. excisa*, Dicks.—Remarkable for the small lageniform-ovate perianth, its contracted mouth shorter than in *J. Gillmani*. The gemmiparous stems are much as in *J. Helleriana*

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and *J. porphyroleuca*, Nees. They are abruptly contracted near the middle into a dense obtuse spike, which is clothed with closely appressed leaves, of a loose oblong areolation. Gemmæ pale green.

6. **Jungermannia Sullivantiæ**, Aust.—J. caule arcte repente flexuoso late cæspitoso ; foliis subovatis caule parum latioribus albidis dissitiusculis erecto-patulis vel subhorizontalibus subconcavis planisve basi valde angustata sessilibus ad $\frac{1}{2}$–$\frac{2}{3}$-bifidis, sinu obtuso, laciniis valde acutis subdivaricatis aut subconniventibus ; perianthio in ramulo ventrali perbrevi terminali valde plicato obovato-oblongo sub pressura obconico primum triquetro demum tereti, ore profunde circa 10-fido eodemque numero plicato, laciniis subconniventibus serratis subintegerrimisve ; foliis involucralibus tribus majoribus erectis plerumque bi(–tri)-fidis margine externa plerumque unidentatis, uno ex tribus omnino integro angustiori valde obtuso heteromorphio amphigastriforme.—*J. bicuspidata*, var. 2, Sulliv. Musc. Alleghan. n. 241.

Hab. On decayed wood, Ohio, *Sullivant ;* Illinois, *E. Hall.*

Remarkable for the very narrow base of the leaf, and for the mostly bifid involucral leaves, with a large tooth on the outside near the middle or towards the base. One of the three involucral leaves (the ventral one) is usually narrower than the others, of an oblong shape, very obtuse and entire at the apex. Color of the whole plant whitish or very pale.—Resembles small forms of *J. bicuspidata*, Linn., in the leaves, but differs very widely in the shape of the perianth. *J. extensa*, Taylor, Syn. Hep., p. 685, differs in the linear-lanceolate perianth with the mouth denticulate. *J. supina*, l. c., p. 684, differs in the unequally bifid leaves, &c.

7. **Jungermannia Gillmani**, Aust.—J. caule abbreviato dense cæspitoso prostrato subarcuato e ventre valde radiculoso ex apice valde incrassato et decendente prolifero-continuo; foliis orbiculato-ovatis verticalibus subconcavis laxe textis bifidis, inferioribus sinu dentibusque plerumque acutis, superioribus valde majoribus plus minusve undulatis emarginato-bilobis, lobis plerumque rotundatis nonnunquam apiculatis, sinu plerumque obtuso ; amphigastriis filiformibus vel filiformi-subulatis aut sæpe sublanceolatis nonnullo valde inæqualiter et profunde (raro subæqualiter et breviter) bifidis cauli adpressis, apice incurvo, basi in uno vel utroque lateribus uniciliato-appendiculata ; perianthio dorsali (adspectu terminali) sessili exinvolucrato (vel raro brevipedicellato atque subinvolucrato) verticali obovato-lageniforme antice subgibboso, apice albido valde angustato profunde laciniato (semper ?), ore ciliato.

Hab. In a cave in a cliff of Potsdam sandstone, Traine Island, Lake Superior (Michigan), *Henry Gillman* (1867).

About the size and with much the general appearance of *J. intermedia*, Lindbg., or *Scapania brevicaulis*, Tayl. Color fuscous- or pale green. Stems cæspitose, 1–3 lines long, thick, upwardly much enlarged, densely radiculose underneath, terminating in a turion-like descending proliferous apex ; innovations subventral. Rootlets long and intricate, fuscous, most numerous from underneath the turion-like apex of the stem. Leaves vertical, orbicular, ovate-orbicular,

or sometimes even broader than long, subconcave, emarginate or bifid, and often slightly narrowed at the apex, obscurely margined, at least the upper ones, which are much enlarged and more obtusely and less deeply lobed and undulate; lobes usually very obtuse or rounded, but often acute or acutish at the apex, frequently apiculate; sinus varying from very broad and obtuse in the upper leaves to narrow and acute in the lower ones; areolation large and rather lax. Amphigastria appressed to the stem and more or less hidden among the rootlets, setaceous or subulate, or the uppermost ones sometimes lanceolate, usually composod of 2–3 rows of cellules, often, however, of a single row, and not infrequently (the upper ones) of 4–6 or more rows, mostly entire but sometimes (the broader ones somewhat equally, the narrower ones very unequally) bifid, mostly with an erect cilia-like tooth on one or both sides at the base, the apex incurved. Perianth situated on the back of the turion-like apex of the stem (much as in *Fossombronia!*) vertical and at a right angle to the stem, mostly sessile and without involucral leaves, rarely short-pedicled, and then with 1–2 leaves on the short stalk, obovate-lageniform (suddenly much contracted above the middle into a long narrow neck), somewhat gibbous *on the front side*, the mouth slightly funnel-shaped, ciliate, and at length incised. Pistillidia numerous. Antheridia in the axils of enlarged leaves near the apex of the stem and innovations. Although the base of the perianth is included between the upper pair of stem-leaves, these have no connection with and are arranged without reference to it. Their base is fully 2–3 times as broad as the base of the perianth and obliquely attached to the stem, and their apex points in a different direction from that of the perianth. Stems are found bearing perianths of both the present and the previous year's growth; these contain numerous pistillidia, which, notwithstanding the presence of antheridia, are all sterile.

8. **Sphagnoecetis Macounii**, Aust.—Sph. caule intricato e ventre stolonifero vel innovante ramoso parce radiculoso nonnullo subjulaceo sursum decrescendo atque apice gemmigero; foliis arcte et laxe imbricatis ovali-rotundis maxime concavis appressis vel oblique subpatulis angustissime hyalino-marginatis integris et integerrimis aureo-viridibus nitidissimis elegantissime punctato et substriolato-areolatis, intercalaribus latis vitreo-pellucidis; amphigastriis subobsoletis ovato-lanceolatis; caule gemmigero proprio albescente stoloniforme succulento subclavato, foliis arcte appressis subechlorophyllosis tenuibus laxissime suboblongo-et distinctius striolato-areolatis apice subemarginatis erosis; gemmis pallidis ovalibus; fructu ignoto.

Hab. On damp ground in the Lake Superior region, associated with other Hepaticæ; also with *Hypnum stellatum*, *H. revolvens*, *Myurella julacea*, *Blindia acuta*, etc.

An elegant species,—scarcely as large as *Gymnomitrium concinnatum*, Corda, and possibly belonging to the section *Scalariformia* of the same genus, but in most respects it resembles a Sphagnœcetis.

Remarkable for the strongly concave leaves, with the margin much constricted in the dry state, as in *Jung. crenuliformis*, Aust., and *Sphagnœcetis communis*, Nees.

The leaves are of a beautiful golden green color, and shine as if polished or glazed. They are composed of largish punctiform cells, which have the contents collected into a somewhat stellate form, and are arranged in straightish rows, the marginal ones scarcely differ from the others, while those at the base in the centre are considerably enlarged ; intercellular spaces rather broad and of a glassy transparency ; dorsal margin subdecurrent, its cellules not elongated. Cells of the stem larger and oval-hexangular, otherwise much like those of the leaves.

The gemmiparous stems, on account of their whitish and closely appressed leaves, look very much like the ordinary stems of *Gymnomitrium concinnatum ;* cellules of the leaves larger and much more distinctly arranged in rows than are those of the ordinary leaves.

9. **Madotheca Bolanderi,** Austin.—M. caule subsimplici flexuoso siccitate subtortuoso tumido 1–2 uncias longo (cum foliis) circa 2½ lineas lato inferne defoliato ; foliis dense imbricatis dimidiato-ovato oblongis obtusis planiusculis patentissimis subsquarrosis in siccis magis minusve convoluto-decurvis cellulis parum crassioribus submarginatis, margine repanda vel hic illic caudato-dentata, ventrali haud inflexa rectiuscula haud expansa, dorsali ad basin longe protracta caulemque obtegente, cellulis rotundis subobscuris haud fulgentibus subuniformibus ; lobo fere discreto parvo lanceolato-subulato, falcato contorto canaliculato obtuso vel acuto, margine repando-undulato, basi valde inæquali longe decurrente parce caudato-lacinulato ; amphigastriis caule vix latioribus lingulato-ovatis oblongisve obtusis acutisve nonnunquam apiculatis sæpe apice fissis, marginibus longe decurrentibus repando-undulatis (præcipue versus basin) caudato-lacinulatis ; perianthio magno e basi breviter obconica late ovato subcompresso superne leniter (circa 5-) undulato-plicato subtus versus basin bicarinato alatove? versus apicem acute 1-nervo, ore angustato truncato minute ciliato ; capsula ovali ; elateribus uni(–bi)-spiris ; foliorum involucralium lobis valde inequalibus acutis subdenticulatis crenulatis? marginatis, amphigastriis acute bifidis.

Hab. California, *Bolander* (1865).

The chief characters of this species are the short, tumid, subflexuous and slightly twisted, nearly simple stems, naked below ; the oblongish (when moist), nearly plane and widely spreading, rather distinctly margined upper leaf-lobe, its lower margin not in the least expanded nor inflexed, its dorsal margin expanded into a rounded auricle which stretches far over the stem; the long-decurrent, tortuous and crisped, and more or less caudate lower lobe and amphigastria; the large perianth, sharply 2-keeled or somewhat winged underneath, and indistinctly nerved above, the very acute and acuminate lower lobe of the involucral leaves, and the oval capsule. The upper lobe of the leaf is sometimes slightly undulate on

the lower margin; when detached from the stem both its margins are frequently slightly ascending, giving it a subconcave appearance. There are frequently 1–2 or 3 caudæ-like teeth, chiefly towards the base, on the upper margin. There are usually 3 *caudæ* on each side of the amphigastria towards the base.

Probably closely related to *M. Niesiana*, Lindbg., Synop. Hepat., p. 271; but that does not appear to be sufficiently described, and it is said to have the lower lobe of the leaf oblong, and the amphigastria obtuse.

10. **Madotheca Sullivantii**, Aust.—Caule plerumque simpliciter pinnato siccando apice valde decurvo, foliis madefactis erectioribus, margine ventrali stricta multumque involutiori, cellulis majoribus punctato-stelliformibus, perianthio ventre late carinato, carina biangulata, etc., facile ab *M. involuta*, Hampe, distinguendua.—*Aust. Hep. Bor. Amer. Exsic. ined., No.* 94.

Hab. In the Alleghany Mountains, *W. S. Sullivant* (1845).

About the size and with much the general appearance of large forms of *Radula pallens*.—Readily recognized by the very straight and strongly involute ventral margin of the leaf, etc.

11. **Lejeunia Sullivantiæ**, Aust.—L. caule stricto appresso parce diviso vel subsimplice; foliis subimbricatis oblique obovato-rotundis erecto-patentibus margine subrepandis, areolis parviusculis subobscuris versus marginem sensim decrescentibus, lobulo subcucullato unidentato; amphigastriis caule duplo vel triplo latioribus ovato-orbiculatis sinu angusto bifidis, laciniis semiovatis acutiusculis: sterilis.—*Hepat. Bor. Amer. Exsic. ined. No.* 96.—*L. serpyllifolia*, var., Sulliv. Musc. Alleghan. No. 273.

Hab. On the bark of trees and on the ground! in the Southern States, *Sullivant*, (1845); Louisiana, *Prof. A. Featherman* (1870).

About the size of *L. serpyllifolia*, or a little larger.—Readily distinguished by its straightish subsimple stems, and by the subopaque smallish cellules, which sensibly diminish towards the margin of the leaf.

12. **Frullania Wrightii**, Aust.—F. dioica, di(-tri)-gyna; caule brevi prostrato subfasciculatim vel vage ramoso; foliis imbricatis subrotundis obliquis valde convexis oblique decurvis siccatis subconvolutis apice et margine inferiore subinflexis basi inæqualiter cordatis margine integerrimis, areolis parvis haud convexis basilaribus parce majoribus marginalibus subquadratis; auriculis mediocribus cucullato-galeatis rotundis subovatisve basilaribus et apicalibus explanatis cauli subcontiguis vel subdistantibus, lobulo dentiformi interjecto parvo plerumque lineari-lanceolato; amphigastriis late obovatis ad ⅓ emarginato-bidentatis margine repando-dentatis caule sesqui vel duplo latioribus; ramulo fructifero perbrevi subclavato vel adspectu fere capituliforme arcte foliato; foliis involucralibus valde majoribus basi sensim angustata sessilibus uno alterove cum amphigastrio coalitis, lobulo dorsali oblongo integerrimo vel subrepando apice cucullato-inflexo, ventrali dimidio breviore ovato-lanceolato sæpe subfalcato acuto planiusculo vel subcanaliculato margine me-

dio hic illic dentato vel integerrimo basi uni-lacinulato : pl. masc. ignota.

Hab. New Mexico, *Chas. Wright* (1861), in Herb. Sullivant.

Has much the general appearance of some forms of *F. œolotis*, Nees ; but that has the leaves scarcely imbricated, much less convex, less decurved, more ovate, repand and subcrenulate on the margin ; auricle smaller, often sublunulate, or most frequently explanate ; amphigastria rather wider and rounder ; ordinary leaf-cells larger, the central ones much more inflated, the basal ones strikingly convex, etc.

Remarkable for the cucullate apex of the upper lobe of the involucral leaf.—The perianth is very young, but appears to be somewhat winged on the keels, etc., as well as on the margin. The auricle is rather variable—often compressed, sometimes nearly touching the stem, at others about as distant as in *F. œolotis ;* at the base and apex of the stem and branches it is always expanded into a suboval or oblong obtuse lamina, with a largish triangular-lanceolate tooth near its base.

13. **Frullania Sullivantiæ**, Aust.—F. monoica, minuta, pallida, vage ramosa ; foliis oblique ovato-rotundis obtusissimis convexis apice decurvis cellulis crassioribus coloratis vel in medio dispersis vel in linea moniliforme brevi et e serie singula aut duplici et ultra exstructa collectis ornatis ; auricula parviuscula obovata et obovato-rotunda cauli adproximata (vix stipitata) basi latiuscula folii marginem haud attingente ; amphigastriis obovato-rotundis caule parum latioribus planis margine subrepanda utrinque subunidentatis ; perianthio subimmerso obovato valde obtuso subtriquetro, dorso convexo, ventre breviter unicarinato utrinque leniter angulato.

Hab. On trees in a cedar swamp near Urbana, Ohio ; detected by Mr. W. S. Sullivant. (Sparingly mixed with *Radula obconica* and *Phragmicoma clypeata* in Musc. Alleghan.)

Smaller than the smallest forms of *F. Grayana*, Mont. ; from which it differs in its vague ramification, flatter and more closely creeping stems ; always obtuse leaves, with the bead-like cellules in the centre most frequently collected into an irregular patch, or when forming a moniliform chain they do not run so obliquely through it, and consist of two or more rows (rarely of a single row) ; auricle shorter and placed close to the stem and parallel with it, its base not extending to the base of the leaf, its mouth less contracted ; amphigastria smaller (about 1½ times as wide as the stem), plane, angular or repand, and usually with a distinct obtuse tooth on each side above the middle ; involucral leaves and amphigastria shorter, their divisions less canaliculate ; perianth more immersed, the apex retuse or obtuse and crowned with a shorter apiculus, whose mouth is slightly expanded and strongly papulose ! inflorescence monœcious, etc.

14. **Frullania pendula**, Aust.—Caule prostrato alternatim bipinnato ; ramulis strictiusculis divaricato-patentibus apice vix attenuatis ; foliis imbricatis oblique lateque cordato-ovatis (magis latis quam longis) concavis integerrimis apice obtusissimis incurvis margine

ventrali abrupte subdecurrentibus, auricula parva obovata vel subclavata pendulo-deflexa a caule distante tecta, lobulo dentiforme interjecto minutissimo e serie singula cellularum minutarum exstructo, areolis parvis rotundis vel ovalibus maxime stelliformibus; amphigastriis maximis reniformi-ovatis (sesqui vel duplo latioribus quam longis) emarginato-bilobis, sinu acuto, lobis latissime ovatis subacuminato-apiculatis, margine plana integerrima, medio umbonnato; spicula masculina rotundo- vel oblongo-ovata; fructu . . .

Hab. Viti or Fiji Islands, *Dr. B. Seemann*, No. 834, partly (1860) in Herb. Sulliv.

A rather large species, the stems 2–3 inches long by about 1 inch wide.—Remarkable chiefly for the auricle being suspended below the leaf and covered by the amphigastria, which are usually as large as the leaves and often twice as broad as long, with the lobes acuminate.

15. **Fimbriaria violacea**, Aust.—Differt a *F. Bolanderi*, Aust.: statura majore, fronde densissime areolata haud marginata subtus latius costata densius radiculosa, squamis brevioribus vix solutis, pedunculo crassiori breviori? basi submultum et toto longitudine parce piloso nigro-purpureo, receptaculo femineo majore subconoideo siccato haud umbonato plerumque tricarpo subtus longissime barbato et piloso, (pileis tubulosis intus [ut in radiculis] muriculatis), perianthiis subdependentibus subpyriformi-ovatis 12–16-fidis violaceis; a *F. echenella*, Gottsche, et *F. elegans*, Spreng.: fronde angustiore rigidiore concavo-canaliculata siccitate arcte involuta, receptaculo femineo haud tuberculoso, etc.

Hab. California, *Bolander* (1866).

About the size of *F. tenella*, Nees, and with much the same shaped fertile receptacle.—The specimens are immature and the peduncle (about 6 lines high) is probably not fully developed. The frond is 1–1½ lines wide by usually less than 1 inch in length, rigid, strongly concave-caniculate, when dry involute (as in *Grimaldia barbifrons*), densely areolated and pale green above, convex-thickened densely radiculose imperfectly squamulose distantly subpunctate and dark purple beneath. The floriferous innovations are very small, often scarcelyexceeding a line in length, and much less squamulose than in *F. Bolanderi;* the antheriferous ones are usually smaller than the others. The fertile receptacle is areolated above like the frond, nearly smooth, and usually 3-fruited. The perianths are of a fine violetcolor, and not subhorizontally spreading as in *F. Bolanderi.*

In *F. elegans* there are no scales underneath the much less rigid broader and exareolated frond; the pale peduncle often arises from the apex of a continuation of the main frond; the lateral innovations are larger and more fully developed (1–2½ lines broad), etc. However the chief characteristic of both this species, and *F. echinella*, is the very prominently tuberculated upper surface of the fertile receptacle.

16. **Notothylas**, *Sulliv. Musc. Allegh.* (1845).—(Carpolipum, *Nees. Syn. Hep. p.* 591.—Carpobolus, *Schweinitz in Journ. Acad. Philadelph.* II. p. 367. f. 2.)—The elaters of this genus (*funiculi*, Nees, l. c.) are

essentially as in *Anthoceros*, but broader and shorter and still more heteromorphous. Like the spores, they are developed in a delicate globular utriculus, which contains from one to four of them, and which disappears upon their arriving at maturity. They usually separate at maturity, but may occasionally be seen adhering together, or even closely adhering to the spores. They appear to about equal the spores in number, and nearly in size, and are of a yellowish brown color, hyaline, much compressed and angular, and of a great variety of odd shapes,—usually oblongish but often (when borne singly) nearly or quite as broad as long. They are frequently variously marked (within) by faint lines or *fibres*, which are sometimes reticulated, sometimes spiral and sometimes annular, but often irregularly tortuous. The coloring matter is mostly collected into the fibres and angles, the latter of which are obtusish and obscurely thickened.

Spores at first in 4s *(utriculi matricales seminum quadrispermi!)*, at length mostly separating, roundish, flattish, obscurely angled, and nearly smooth. Antheridia very large, composed of large inflated convex cellules, usually borne singly in deep pits in the upper surface of the frond, which are surrounded by a jagged margin.

Rootlets smooth or minutely granulose (within).

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17. **February Meeting.**—At the meeting of the Torrey Botanical Club held February 27, 1872, Prof. John Torrey in the chair, Dr. Parry laid before the meeting two rare plants from Oregon, collected by E. Hall—*Coptis asplenifolia*, Salisb., figured in Hooker's Flora Boreali-Americana, and a new species of *Isopyrum*, named *Hallii* by Dr. Gray after the discoverer. This last would be a very desirable addition to the garden, being quite ornamental in foliage and flower, and an early bloomer.

Mr. Leggett presented to the College Herbarium a specimen with cone of a new species of pine—*Pinus Elliottii*, Engelm.—from South Carolina, sent by H. W. Ravenel, Esq.

Also were shown the following new books belonging to the Herbarium Library :

Flora of the Galapagos Archipelago. J. D. Hooker.

Internationales Wörterbuch der Pflanzennamen. W. Ulrich.

Geschichte und Litteratur der Lichenologie. A. von Kumpelhuber.

Die Vegetation der Erde. A. Grisebach.

Sertum Tianschanicum. Baron Fr. v. d. Osten-Sacken und F. J. Ruprecht.

Wonders of Vegetation. Translated by Prof. Schele de Vere.

Botanische Theil ; Fungi, Hepaticæ and Musci ; Voyage of the Frigate Novara around the World. H. W. Reichardt.

Sketches of the Botany of Pennsylvania. By Prof. Thos. C. Porter, Easton, Pa.

Members present, sixteen, viz. : Messrs. Torrey, Paine, Wilber, Hogg, Ruger, Leggett, Hall, Merriam, Wood, Parker, C. B. Gerard, McIntyre, Hyatt, Gross, Parry, Le Roy. P. V. Le Roy, *Sec.*

18. **Wood's Plant Press.**—The method of drying botanical specimens

heretofore generally practised, a method more particularly described in the November and December Bulletins, is tedious and burdensome. Few, we think, will deny this. The collector who attempts to keep up with the season of flowers must have in use an immense quantity of paper—must rearrange specimens and paper at least twice a day—must thoroughly dry the sheets separately daily—all this besides the collecting makes botany a *business* rather than a recreation, and leaves too little time for study or any other duty.

It is the drying-press which is in fault—that old-fashioned press used by botanists from Linnæus down. True, it has done good service, and so has the sewing-needle. Shall the sewing-*machine* be rejected on this account? If the intolerable drudgery of plant-drying by *absorption* can be obviated by an invention, why not try it? Wood's *wire-press*, described in the "Botanist and Florist," p. 10, and "Class-Book," p. 15, is such an invention, unpatented, free to all collectors. It dries by *evaporation* rather than absorption, and thus makes available all the sources of heat, whether natural or artificial. It requires comparatively but little paper—less than half the amount needed in the old process; hence it is portable, and serves the double purpose of portfolio and press. It requires no changing of specimens and papers, no drying of damp and mildewed sheets.

In fair weather the wire press dries in the wind and sunshine; in foul weather, by the fire. In either case, after one or two days the specimens will be found thoroughly cured, and as bright in colors as is possible by any other known method.

To the travelling collector this form of press is invaluable. With it so light is his labor in drying his specimens that it occasions him little if any delay, and so light his luggage that a single donkey will suffice him in lieu of half a dozen for its transportation. With this simple press the writer, during a single year, cured more than three thousand specimens, in a protracted journey of about fifteen hundred miles. A. W.

19. **Drop-Bottle.** *See the Figure in the last No.*—I have the jet, C, turned obliquely upwards; the air-tube, A, turned downwards; and at the other end of the jet, D, a small bell made in the tube to hold a wisp of cotton for a much needed *strainer*. D. C. E.

20. **Marsilia quadrifolia**, L.—I have from Florida a Marsilia so labelled, but it is more likely to be one of the western species, *M. uncinata*, Braun, for instance. D. C. E.

21. **Euphorbia Helioscopia**, L.—Abounds near the river bank, and farther back across the river, opposite to the Main Street dock, Poughkeepsie. I have never seen it nearer to New York City.
Jas. Hyatt.

22. **Cryptogamic Publications.**—We have received *The Erysiphei of the United States*, by M. C. Cooke, M.A., and C. H. Peck, reprinted from the Journal of Botany, for January, 1872.—Also a prospectus of *Grevillea, a Monthly Record of Cryptogamic Botany, with Illustrations*,

from Mosses downwards, "somewhat like Hedwigia." 5 shillings sterling, post free. Address M. C. Cooke, 2, Grosvenor Villas, Junction Road, London, N.

23. **Quercus and Salix.**—After reading De Candolle's experience in determining the species of Quercus, one with more limited means of comparison may well hesitate before pronouncing positively. The stable distinctions necessary for classification are not always to be found, though the conviction remains that such distinctions must exist The scientific study of the variations of specific forms is one of the most pressing needs of Biology. We shall welcome any observations tending in this direction. The opening season will soon afford an opportunity for a study of the Willows of our district, about which we are quite unfurnished with data. We invite those of our friends who have the opportunity to study this family to communicate the results to us, and specimens to the Club Herbarium.

Of *Quercus bicolor*, Willd., Mr. Austin writes that it is "most nearly related to *Q. macrocarpa*, Mchx. The acorns are perfectly similar in both, and unlike in some respects those of any other species: a true *White Oak*." Of *Q. prinus*, L.: "I have never been able to see wherein the var. *monticola* differs from this." Messrs. Austin and Allen both express a decided conviction that *Q. tinctoria* is a very distinct species. That Oaks may hybridize, we have received from Dr. Engelmann a remarkable example in a specimen labelled "*Quercus palustris-imbricaria, hybris*, near St. Louis, single tree, May, 1870."—We had supposed the Chestnut Oak, *Q. prinus*, var. *acuminata*, to be one of our most common Oaks, but finding no specimen from this region in our possession, we referred to the State Flora, where Chemung Co. is the only locality given. We have found it in Connecticut, and Gray's Manual says it is common in the Middle States.

BROUSSONETIA, Vent.—**B. Papyrifera**, Vent.; Laurel Hill, L. I., *Ruger*; fruits finely in Greenwood Cemetery, *W. H. L.*; frequent in cultivation or springing up from suckers.

URTICA, Tourn.—**U. Gracilis**, Ait.; common; N. Y.—**U. dioica**, L.; not rare about roadsides; N. Y.; Staten Island; Bergen Hill; Train's Meadow, etc., *Ruger*; Glen Cove, *Coles*.

LAPORTEA, Gaudichaud.—**L. Canadensis**, Gaud.; common; N. Y.; Fort Washington, *W. H. L.*

PILEA, Lindl.—**P. pumila**, Gray; very common; N. Y.

BOEHMERIA, Jack.—**B. cylindrica**, Willd.; "In shady swamps, Bloomingdale and Weehawken," *Torr. Cat.*, Central Park, *R. & P.*; Closter, common, *Austin*; rather common on L. I.; the var. **B. lateriflora**, by Bedford Creek, *Ruger*.

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PLATANACEÆ.

PLATANUS, L.—P. occidentalis, L.; common; N. Y.; Central Park, *R. & P.*

JUGLANDACEÆ.

JUGLANS, L.—J. cinerea, L.; rather common; in woods, Manhattanville, *Torr. Cat.*; Central Park, *R. & P.*—J. nigra, L.; not uncommon; woods, *Torr. Cat.*; native, Walnut Ridge, Passaic Co., N. J., also Sussex Co., *Austin*; Central Park, *R. & P.*; Glen Cove, *Coles.*—J. hybrida, LeConte; vide *Torr. Cat.* and *State Flora.* Some of our Flushing friends should look into the history of the seedlings said to have been raised by Mr. Prince.

24. Danthonia, DC.—D. Allenı, n. sp.—Culm sparingly branched, stout, erect, about three feet high, triangular and compressed (at least below in the dried state), and with the narrow side concave. Leaves moderately long, flat, about two lines wide; midnerve conspicuous beneath but not visible on the upper side; sheaths naked and polished, the lower ones large and conspicuously imbricated; ligule with numerous long and delicate fringes. (Terminal) panicle decompound, subsecund, rather open, its branches longish and (each one) subtended by a subulate bract, which is about as long as the glumes. Glumes about reaching to the bristles of the uppermost flowers of the spikelets. Spikelets about 15 in number, about 10-flowered, compact, terete, 6-7 lines long. Lower (outer) palea clothed with rather numerous long, silky hairs, and with a distinct tuft of the same at the base, about half as long as its own awn, distinctly about 7-nerved; awn very slender, setaceous, nearly erect, not twisted except at the base, where it is pale in color, very minutely and closely scabrous, and somewhat bent sideways; (lateral) teeth long-awned. Lateral panicles (only a single one in the specimen before me) * smaller and partly included.

This species is readily distinguished from its congeners in this country: by its rather tall and stout, somewhat branched culm; naked, flat, rather broad leaves of moderate length, with naked and polished sheaths; larger, open panicle, with the branches bracted at the base; spikelets longer than the glumes; etc.

Detected by Dr. Allen, at Rockaway, L. I.

D. compressa, Austin.—[Noticing a disposition among botanists to ignore this species, I was led recently to re-examine it and to compare it with our other species. I find it to be very distinct, as follows:]

Somewhat tufted. Culm slender, 2 feet high, geniculate, ascending, decumbent at the base, the top nodding (at least in flower), trigonal, often compressed, the narrowest side concave, smooth (or very minutely roughened only just below the joints). Leaves very long and narrow, the radical ones often reaching the panicle, the uppermost usually overtopping it; sheaths naked; ligule with long,

* I find in one of two specimens just sent me, that there is a branch from each joint! with the spikes mostly wholly included in the sheaths.

silky fringes. Spikelets racemose-paniculed, about ten in number, and each about 5-flowered. Florets with a very conspicuous tuft of silky hairs at the base. Outer palea with rather numerous long hairs on its surface, about half the length of its awn, its teeth long and slender and awn-like; awn setaceous, slightly bent sideways, or often erect, pale at the twisted base, not twisted towards the apex. Branches of the panicle about five in number, the lowest one usually deflexed in fruit, the second one widely spreading, the rest erect.

Found growing abundantly, side by side with *D. spicata*, in open places in woods, near Little Falls, New York, in July, 1868, and August, 1869. It has also been found in Pennsylvania (Porter), and New England (H. G. Jesup).

D. spicata, Beauv.—Differs from *D. Alleni* in its much smaller size, simple culms, and in the branches of the panicle not subtended by bracts; from *D. compressa* in its straight and erect culms, and much shorter leaves; from both in its usually (not always!) terete culms; more or less hairy and at length convolute leaves with the ligule shorter fringed; in its spiked-panicle with the branches all erect-appressed in fruit; in the much shorter and fewer hairs at the base of the flower and usually on the back of the outer palea; in the outer palea being furnished with a much shorter and stouter awn, which is strongly bent to one side, dark colored at the strongly twisted base, more or less twisted to the apex, and rather more coarsely and distinctly scabrous; the teeth of the outer palea are also shorter, often very short and obtuse.

D. sericea, Nutt.—Is readily distinguished from all the preceding by its much larger glumes and much more hairy flowers. In general habit it resembles *D. spicata* very much, but, besides the above-mentioned characters, it is more robust, the leaves are more hairy, and the awn and teeth of the lower palea are much longer.

C. F. Austin.

25. Popular Science.—It is a good sign that publishers are seeking to feed the growing appetite for scientific knowledge, but it is a great mistake to publish books professing to impart information, unless the writer or translator has some knowledge to impart. A friend sends us some criticisms, a few, at least, of which we think it proper to print in the Bulletin, as the book to which they refer was introduced by it into good company.

"*Wonders of Vegetation, translated by Schele De Vere,*" noticed in the last number of the Bulletin among the new books belonging to the Herbarium Library, seems to be a work rather out of place where it is, and, perhaps, better adapted to the Zodiacal botany of the agricultural department, or for the private libraries of the extra members legislated last year into the Club. It certainly does, however, recount remarkable wonders of vegetation, *e. g.*, p. 123: "It is here, [Tanjourra] especially, that the *Asclepias gigantea* is found growing; *a prickly acacia* covered with a number of exuberant lianes." Pp. 243, 244: "*Vallisneria spiralis*," * * * "the marvellous pheno-

mena which it presents at the time of flowering. *The female flowers appear floating on the surface, as if in anxious expectation of others which they are to fertilize.* As if in obedience to their call, the *male flowers, borne upon a long spiral stem, gradually rise from the bottom of the pond, unrolling the long flower-stalk, turn after turn,* till they also reach the surface. Here they meet the first comers; they touch, and immediately begin to retreat once more to their dark homes beneath the waters, where they ripen their seed, and provide for new generations." P. 110: "Mount Lebanon *separates the Holy Land from Syria,* above whose loftiest mountains it towers. The range has the form of a horse-shoe, and measures *not less than three thousand miles in length.*"

These are but specimens. The italics are ours.

26. Erodium, L'Her.—I had the good fortune to find *Erodium cicutarium,* L'Her., in full flower yesterday, at Poughkeepsie, near the Fall Kill Creek and the Hudson River R. R. There was a small patch of it a few inches square under a red cedar, *Juniperus Virginiana,* L. The ground looked to the south-west. Of course the plant was perfectly wild and taking care of itself successfully.

April 9, 1872. JAMES HYATT.

27. Marsilia quadrifolia, L.—Found at Dallas, Dallas Co., Texas, July, 1870. J. BOLL.

28. Marsilia longipes, *n. sp.,* Austin.—About the size of *M. vestita,* H. & G., but more slender and much less hairy; sporocarp oblong- or ovate-lanceolate, about two and a half to three lines long by less than one line in thickness, continuous with the peduncle, which is an inch or more in length. Mixed with the specimens of *M. vestita* from the Herbarium of Dr. Gray, collected in Oregon, in 1871, by *Elihu Hall.* C. F. A.

29. Maples.—March 12th, 1871, the Silver Maples in the streets of Brooklyn were in bloom. This year, the first appearance of flowers upon the same trees was April 5th, a difference of twenty-four days, so that our season is now about three or four weeks later than last year. It seems to be a general impression that the *Acer rubrum* blooms earlier than *A. dasycarpum,* but with us the latter is always ten days or two weeks the earlier.

The order of blooming is: 1. A. dasycarpum; 2. A. rubrum; 3. A. platanoides; 4. A. saccharinum; 5. A. pseudo-platanus.

J. S. M.

30. New Publications.—1. *Twenty-third Report of the Regents of the University on the New York State Cabinet of Natural History for the Year* 1869: *Report of the Botanist; Printed in advance of the Report: Albany,* 1872; pp. 135, with six colored plates of Fungi.—In this Report Mr. Peck makes another large and valuable contribution to the Flora of the State, especially the Cryptogamic, sixty-seven of the Fungi and one Alga being new to science. He gives a list of one hundred and twenty species growing on the exposed summit of Mt. Marcy; flowering plants, fifty; Club Mosses, three; Mosses, thirty-two; Liverworts, ten; Lichens, twenty-three; Fungi, two species; and adds: "The number of marsh plants growing at this

high altitude is remarkable. The necessary conditions . . . are afforded by the clouds and fogs that so frequently envelop the top of the mountain." It is highly gratifying that the State has so able and active a Botanist.—2. *Report on Botany, read before the Albany Institute, Feb.* 6, 1872; by Charles H. Peck, A.M.—A large part of this Report is devoted to an elucidation of the cause and cure of "black knot in cherry and plum trees. Mr. Peck concludes the disease to be of fungoid nature, having the dual form of *Cladosporium* and *Sphæria*. A highly interesting account of our new Arceuthobium is given, from which we quote: "We infer that the history of the plant is as follows: The fruit being mature in September, some bird or other small animal seeks it for food. The seeds being covered with a very viscid coat, adhere more or less to the beak of the bird or the mouth of the animal, and being a source of annoyance to it, they are rubbed off from time to time on the branch. Those that adhere through the winter to the young and tender shoot of the past season, germinate and form, during the first summer, the little hemispherical buds above mentioned. During their second season these increase in stature and form their flower buds. Probably early in the following season, the third in the life of the plant, the flowers expand, and by the middle of September the fruit is mature." We are sorry to see that Mr. Peck and Mr. Wood have been in haste to name this plant while Dr. Engelman, to whom the subject properly belongs, is engaged in unravelling the difficult relations of the species.—3. A beautiful colored plate of *Brevoortia Ida-Maia*, Wood, with the Article on the genus by Prof. Wood, from the Journal of the Academy of Natural Science, in which he defends the genus, in opposition to Dr. Gray's view, which transfers it to *Brodiæa*.

31. **Meeting of April 9th.**—Present, Messrs. Torrey, Barstow, Bower, C. Gerard, Henes, Hyatt, Leggett, LeRoy, McIntyre, Merriam, Payne, Ruger, Wilber, Wood—14. Mr. Hyatt exhibited *Erodium cicutarium* in bloom.

32. **Errata.**—Owing to the delays incident upon correcting proofs through the post-office, our March No. was kept back till the middle of April, yet, nevertheless, is not without flaws. In the § **New Hepaticæ**, No. 1, 3d par., for "*S. adustum*" read "*S. adustus;*" for "*Sarcoscyphus adustus*" read "*Gymnomitrium adustum;*" No. 2, 2d par., for "*S. densifolius*" read "*S. emarginatus;*" p. 14, No. 9, line 13, insert a hyphen before "oblongisve;" p. 16, No. 13, 3d par., put ":" instead of ";" after "Mont.," and in 3d line read "leaves always obtuse with the bead-like cellules in their centre;" p. 17, No. 15, 3d par., line 5, read "canaliculate;" p. 20, § **Urtica**, read "U. **gracilis**;" § **Boehmeria**, for "Jack" read "Jacq." There are a few other obvious typographical faults, and, in numbering the sections, two Nos. have been omitted, an error which we shall let pass, as it will lead to no inconvenience.

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33.—The Torrey Botanical Club met Tuesday evening, April 30th. Present, eighteen members, viz., Messrs. Torrey, Wood, Allen, Leggett, Austin, Merriam, Bower, Gross, Hogg, Wilber, McIntyre, Ruger, C. Gerard, Parker, Paine, Hall and LeRoy. Visitors—three.

Mr. Hogg brought specimens of *Forsythia suspensa*, *Corylopsis paniculata* and *spicata*, *Stachyurus praecox*, *Parrya Siberica*, and two species of *Orchidaceæ*.

Mr. Austin brought, and distributed specimens of *Danthonia compressa*. *Danthonia Alleni* was shown by Dr. Allen. Both are described in the Bulletin.

Icones Illustratrae Indiae Orientalis, 6 volumes, by R. Wright, received in the College Herb. Library. P. V. LeRoy, Sec.

34. **Helonias.**—On the 3rd of May, Messrs. J. H. Redfield and C. F. Parker, Dr. Hassler, two Messrs. Tryon and myself made an excursion from Philadelphia into the edge of the Pines, chiefly in search of *Helonias bullata*, L. We were quite successful, finding the plant in all stages of the flowering process, from the imperfect bud to the turning green of the perianth. The plant is a shy-blooming thing, only a few out of many sending up a scape, and those few being very far between, except where two or three scapes grow from the same clump. The favorite situation for flowering seemed to be just on the edge of a swift stream, or in rich moist earth supported by some root or log that either crossed the stream or lay between two holes filled with water. One plant I found in flower close beside and touching *Orontium aquaticum*, also in bloom and growing in the water. The easiest way to find the flowers was to make one's way in the middle of the stream by means of logs in the water, or clinging to the branches above, now and then getting deep in the water or mud; and all the while struggling through a fearful tangle of underbrush, shrubbery and prickly stuff, which quite hid the sun and limited the view to a rod or two. The denser the thicket, the more freely the plant bloomed; but, still, hunting for the flowers reminded me of the hunt for *Aplectrum hyemale* in a locality where that plant is abundant. Nor was the difficulty at all ended with the finding of the plant, for the scapes are hollow, very thin and brittle, and filled with water; and, after the roots were apparently quite loosened from the earth, the least shock or jerk in lifting the plant up, would cause the scape to snap off, and spoil the beauty of the specimen. Then, after getting up the plant, it was very difficult to get out of the thicket without spoiling the flowers or breaking the scape to pieces against the brush, or by the shock of a jump or fall. Altogether, we came to the conclusion that *Helonias bullata* is a very hard plant to collect in flower. Besides the locality of last year, we found another locality new to us, but probably the same that Dr. Leidy discovered some years ago. Unfortunately, however, the plant must perish there before another season, as the thicket is just cut off and the clearing of the ground commenced. This year, though, the plants grew and flowered finely, and were much farther advanced than those first mentioned. Here, also, we

found a clump with *six* scapes, each scape two feet eight inches high, and the flower heads a trifle over two inches long. This clump I dug up, and by careful supporting and wrapping carried safely, without any breaking, to Philadelphia, where we hope it will thrive. Much beauty is added to the purplish rose flowers by the bright, blue color of the exserted stamens. The leaves, at time of flowering, are not more than one fifth the size they afterwards attain; and the perianth seems regularly to turn to a brownish-red before becoming green.

Among other things in flower we found *Sassafras*, *Spice-bush*, *Amelanchier*, *Euphorbia Ipecacuanhae*, several *Vaccinia*, *Gaylussacia resinosa*, *Cypripedium acaule*, *Viola pedata*, *V. lanceolata*, *V. sagittata*, *V. cucullata*, *Sisymbrium Thaliana*, *Draba vera*—the largest specimens I ever saw, scapes often seven and eight inches long. A very little *Pyxidanthera* still remained in flower; *Leiophyllum* was not yet out. A large area of *Sarracenia* and of *Nymphaea* (the small form) seemed to have suffered unusual blight, and nearly all the plants were dead where all last year were strong and vigorous.

We found a large bunch of *Phoradendron flavescens* growing on a branch of a staminate tree of *Acer rubrum*. The tree was about two feet in diameter at base—I could not clasp around it with both arms; and the bunch of mistletoe was about 40 feet high up, on a limb of about the thickness of a man's arm, and was greater in the diameter than the trunk of the tree at the base. We had no time or means to collect the specimen.

I also practically demonstrated the utility of "Wood's press" for such excursions. I put my specimens as collected at once into a press of that kind, and changed the papers immediately on arriving at Philadelphia, but had no chance to change again till the 10th inst., when I found the papers much drier than I expected, and the specimens doing well. I. H. H.

Pine street, New York, May 14th, 1872.

35. Willows.—I send you a few observations on the Willows of this locality, without any hope of adding to what is known by specialists. The location is on the Connecticut river, about 125 miles from its mouth, latitude 42° 50′ N. The river, within a distance of a few miles, receives several lesser streams flowing down from among the hills. The rocks are slate and granite.

I find here of native willows:—1. *Salix rostrata*, Rich, (*livida*, Wahl.) This is a tree-like shrub, growing in pastures and on the borders of woods, not apparently affecting water or wet places, nor have I observed it to be variable.

2. *Salix humilis*, Marshall. This is a shrub, and our earliest species. It does not seek water or seclusion, but takes to roadsides, fences, and neglected places. It is extremely variable in general appearance.

3. *Salix sericea*, Marshall. A shrub with silky ovaries and densely silky under-surfaces to the leaves; drying black. Found on low sandy banks of brooks.

4. *Salix lucida*, Muhl. This is a small tree with glossy foliage, which is found in similar situations with the *S. sericea*.

5. *Salix nigra*, Marshall. This is a well marked tree with black bark and yellow branches. I have not observed that it is variable. Indeed I have seen no young trees, but a number of old and picturesque ones over-hanging streams or shading watering-troughs on old farms, doubtless planted there.

6. *Salix cordata*, Muhl. A shrub growing in sandy flats subject to inundation. This is the most variable plant in its foliage, I think, that I have ever met with. I should find it impossible to fix upon any definite characteristics of leaf or stipule. In the summer or fall it is difficult to believe that these Protean forms do not embrace several species, but the catkins reduce them to unity in the spring.

Of the species of Salix which are called *adventive*, we have two :—

7. *Salix alba*, L. A fine tree growing by the roadside and near, but not directly upon, the banks of streams.

8. *Salix purpurea*, L. This shrub I found in a hollow place in the middle of an island in the Connecticut river. These were staminate plants, but they seemed to be thriving and extending. It must have been introduced there in some accidental way.

There ought to be and probably are several more of our native willows in this locality, but I have not discovered them.

I find the species of willows easier to distinguish at a distance of thirty to fifty rods than by a closer inspection. Several of the above have quite a marked character at a considerable distance, which seems to vanish on a nearer approach.

ANN E. BROWN, Brattleboro, Vt.

36. **Publications.**—1. *The Lens, a Quarterly Journal of Microscopy and the Allied Natural Sciences; No. 2. April*, 1872; *Chicago.*—Mr. Babcock's Flora of Chicago is continued from Saxifragaceæ to Campanulaceæ. It is interesting to notice how many of the plants most abundant with us are rare or wanting. *Leucanthemum vulgare*, L., is even "cultivated in a garden." To students of cryptogamic botany this publication must prove of great value.—2. *Mann's Catalogue, second edition, revised and corrected.* B. Pickman Mann, Cambridge, Mass. The preface contains the new species not yet included in Gray's Manual, such as, *Arceuthobium minutum*, Engelm. *Danthonia compressa*, Aust.—3. In the *Naturalist* for May, Dr. Gray calls attention to a question raised by Babington as to Anacharis. "It may be that we have two water weeds...one dicœcious, the other hermaphrodite. It is to be hoped that our botanists will examine the plants they meet, and preserve specimens of any different kinds or sexes of flowers they may detect."

37. **Mann's Duplicates.**—Mrs. Mary Mann, 19 Follen street, Cambridge, Mass., offers for sale foreign and native sets of these duplicates. Collectors would do well to send for a circular.

38. **Orchids.**—**Pagonia verticillata**, Nutt., and **Cypripedium parviflorum**, Salisb.; in bloom May 19th, between Tennafly and the Hudson.

G. I. C.

CARYA, Nutt.—**C. alba**, Nutt. ; common ; N. Y. ; Central Park, *R. & P.*—**C. microcarpa**, Nutt.; Closter, *Austin ;* Glen Cove, *Coles ;* Central Park, *R. & P.*—**C. sulcata**, Nutt. ; Central Park, *R. & P.*—**C. tomentosa**, Nutt. ; common; N. Y.; Central Park, *R. & P.*—**C. porcina**, Nutt. ; Closter, *Austin ;* Yonkers, *Pooley ;* Chatham, N. J., *W. H. L. ;* not reported from New York Island or Long Island.—**C. amara**, Nutt. ; common ; N. Y. ; Central Park, *R. & P.*

CUPULIFERÆ.

QUERCUS, L.—**Q. alba**, L. ; common ; New York ; Central Park, *R. & P.*—**Q. obtusiloba**, Mchx. ; common on Staten Island, Long Island, and south of the Raritan ; New York, 1862, *Austin ;* Central Park, *R. & P. ;* Staten Island on hills, New Jersey in sandy soil, *Allen.*—**Q. macrocarpa**, Mchx. ; Orange Co., rare, *Austin.*—**Q. bicolor**, Willd.; Staten Island and New Jersey ; Central Park, *R. & P. ;* not reported from other districts, though probably found on Long Island and in Westchester Co.; vide Mr. Austin's observations, § 23.—**Q. Prinus**, L.; Central Park, *R. & P.*; South Jersey, *Austin;* var. **monticola**, Mchx.; N. Y.; Central Park, *R. & P.* ; Snake Hill, *Allen ;* Closter, *Austin ;* Glen Cove, *Coles ;* not uncommon ; var. **acuminata**, Mchx. ; *LeRoy* ; Keyport, *Lockwood ;* Central Park, *R. & P.*—**Q. prinoides**, Willd. ; barrens, Long Island and New Jersey ; Closter, *Austin.*—**Q. Phellos**, L. ; Suffolk Co., L. I., *State Flora ;* Keyport, *Lockwood ;* near Long Branch.—**Q. nigra**, L. ; Long Island and New Jersey south of the Raritan ; Central Park, *R. & P.* ; **Q. heterophylla**, Mchx. ; South Jersey, *Austin ;* [extra-limital?]—**Q. ilicifolia**, Wang. ; Closter, *Austin ;* barrens of Long Island and New Jersey.—**Q. falcata**, Mchx.; common in New Jersey, *Torr. Cat. ;* Keyport, *Lockwood ;* South Jersey, *Austin.*—**Q. coccinea**, Wang. ; common ; Central Park, *R. & P. ;* var. **tinctoria** ; common ; especially near Jamaica, L. I., *Allen.*—**Q. rubra**, L. ; common ; N. Y. ; Central Park, *R. & P.*—**Q. palustris**, Du Roi ; common ; Bloomingdale, *Torr. Cat. ;* Central Park, *R. & P.*

CASTANEA, Tourn.—**C. vesca**, L. ; var. **Americana**, Mchx. ; very common ; N. Y. ; Central Park, *R. & P.*—**C. pumila**, Mchx. ; there has been no confirmation of the old statement that this plant is found on Long Island.

FAGUS, Tourn.—**F. ferruginea**, Ait. ; common ; N. Y. ; Central Park, *R. & P.*

CORYLUS, Tourn.—**C. Americana**, Walt. ; common ; Central Park, *R. & P.*—**C. rostrata**, Ait. ; Central Park, *R. & P.* ; Yonkers, *Pooley ;* Rockland Co. ; Morris Co., N. J., *Austin ;* New Providence, &c., *W. H. L.*

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OSTRYA, Micheli.—O. Virginica, Willd.; New York and New Jersey, *Torr. Cat.*; Palisades; Closter, *Austin;* Yonkers, *Pooley;* Glen Cove, *Coles;* N. Y.; common on Long Island, *Merriam.*

CARPINUS, L.—C. Americana, Mchx.; common; N. Y.; Central Park, *R. & P.*

MYRICACEÆ.

MYRICA, L.—M. Gale, L.; Long Island, *Merriam.*—M. cerifera, L.; common; N. Y.

COMPTONIA, Solander.—C. asplenifolia, Ait.; common; Blomingdale, *Torr. Cat.*

BETULACEÆ.

BETULA, Tourn.—B. lenta, L.; common.—B. lutea, Mchx. f.; Bloomingdale, *Torr. Cat.*, but this locality is not mentioned in State Flora; North Salem, Westchester Co., *S. B. Mead.*—B. alba, var. populifolia, Spach; very common. *B. papyracea*, Ait.; *Eddy in Torr. Cat.*, probably an error, as well as *B. glandulosa*, Mchx., on the authority of *Le Conte.*—B. nigra, L.; Closter, *Austin;* Bulls Ferry, *Le Roy;* Paterson, *W. H. L.*; Glen Cove, *Coles;* common in New Jersey, *State Flora.*—B. pumila, L.; Budd's Lake, *T. C. Porter.*

ALNUS, Tourn.—A. incana, Willd.; Budd's Lake, Morris Co., N. J.; *Austin;* Scarsdale, Westchester Co., *Merriam.*—A. serrulata, Ait.; common; N. Y.

39. Urticaceæ.—By a typographical error the following were omitted in their proper place.

PARIETARIA, Tourn.—P. Pennsylvanica, Muhl.; Tappan, N. J., scarce, 1857, *Austin;* Sandy Hook, not abundant, July 5th, 1870, *Ruger;* Central Park, *R. & P.*

CANNABIS, Tourn.—C. sativa, L.; not uncommon; N. Y.; Jamaica; Canarsie, Communipaw, &c.

HUMULUS, L.—H. Lupulus, L.; Closter, common, *Austin;* Hoboken Heights, *Ruger;* New Lots, L. I., *Wilber;* Central Park, *R. & P.;* Chatham, N. J., *W. H. L.*

40. At the regular meeting of the Torrey Botanical Club, held May 28th, the following members were present:—Torrey, Wilber, Merriam, Ruger, Bower, Day, Paine, Gerard, Parker, Henes, Hogg, Pollard, Leggett, Gross, Hall, Redfield, LeRoy.

The following is a list of the books received for the College Herbarium Library:—

Encyclopædia Methodique: Botanique, par Lamarck & Poiret, 20 vols. *Flora Sibirica*, Gmelin, 2 vols. *De Fructibus et Seminibus Plantarum*, Gærtner, 5 vols. *Plantes Nouvelles de Hort. J. M. Cels.*, par Ventenat. *Theophrasti Historia Plantarum. Civil and Natural History of Jamaica*, P. Browne. *Cornus*, by L'Heritier. *Novas Plantas*, Rottböll. *Flora Guajanensis*, Aublet, 4 vols. *Collectanea*,

W. C. Jacquin. *Eclogae Americanæ*, Wahl, 2 vols. *Symbolae Botanicae*, Wahl, 3 vols. *Historia delle Piante nei Lidi Veniz.*, Zanichelli. *Fasciculi Plantarum Americanarum*, Plumier. *Rariorum Stirpium, per Pannonicam, Austriam, et vic.*, C. Clusius, 1583. *Historia Commentariorum Stirpium*, L. Fuchsii, 1549. *Fungi Javanici*, Nees ab Esenbeck. *Pugillus Plantarum Javanicarum*, Nees ab Esenbeck. *Memoire des Ternstroemiacées; Memoire des Onagraires; Memoire des Nymphæacées;* A. P. De Candolle. *Monographie Genre Pulmonaria*, B. Du Mortier. *Metamorphose der Pflanzen*, J. W. Von Goethe. *Monographie der Riccieen*, J. B. W. Lindenberg. *Plantarum Minus Cognitarum Centuriæ*, J. C. Buxbaum, 2 vols. *Synopsis Filicum*, Swartz. *Flora Indiæ Occidentalis*, Swartz, 3 vols. *Flora Lapponica*, C. Linné. *Synopsis Plantarum*, D. Dietrich. *Flora Rossica*, P. S. Pallas.

P. V. LeRoy, Sec.

41. **Notes by Mr. Ruger.**—In a court-yard leading from the Wall street ferry, Brooklyn side, **Galeopsis tetrahit**, L., was found by Mr. Merriam. This seems to have been forgotten by him. I have a specimen from there.—It may not be uninteresting to state that *Briza maxima*, L., has escaped from the gardens in Springfield, Mass., near the R. R. station, where I saw it last summer.—**Stellaria Holostea**, L., has grown on Train's Meadow Road for several years.—**Chenopodium glaucum**, L., grows in Newark avenue, Hudson City, N. J.—**Hydrophyllum Virginicum**, L., has not been heretofore reported from Long Island. It grows at St. Ronan's Well, and elsewhere on the north side.

42. **Darlingtonia.**—The *Gardeners' Monthly*, for June, claims for Mr. Taplin, South Amboy, the credit of being the first to bring this plant into bloom on this side of the continent. Dr. Thurber had it flower early in April, 1870, as reported in the Bulletin for that month. Mr. Bower also had it in flower, a year or more ago; and, if we rightly understood Dr. Torrey, a lady, to whom he gave some of the roots about the same time, was very successful. We are the more surprised at this oversight on the part of the editor, as the flowering of these plants gave occasion to Dr. Torrey's testimony to the remarkable accuracy of Mr. Charles Sprague's botanical drawing (vid. Bulletin, April, 1871). De Candolle had doubted whether Sprague had possibly made a mistake, or, as seemed more likely, Nature had deviated. Dr. Torrey showed that Sprague and Nature were all right. It was M. De Candolle, excellent botanist though he is, who had erred.

43. **Hall's Oregon Plants.**—The Proceedings of the American Academy of Arts and Sciences for February, 1872 (issued in May), contain an enumeration, by Prof. Gray, of a collection of plants made by Mr. Elihu Hall, in Oregon, in the summer of 1871. The collection numbers 700 species. We are so accustomed, in collections made upon the Pacific Coast, to find large accessions to our North American Flora, that one in looking over this enumeration is struck with the fewness of new species. Many little-known plants have been added by this collection to our herbaria, and the synonymy of

others rectified. Dr. Gray, as usual, takes advantage of this publication to put on record some new species by other collectors and to revise several genera. One of the most interesting of Mr. Hall's discoveries is a new species of *Lophoclaena*, a grass of singular structure. Only one species, *L. Californica*, has heretofore been known; the new one is appropriately called *L. refracta*. G. T.

44. **Marsilia.**—An esteemed correspondent suggests that "the notices about the two Marsilias (the old European one from an entirely unlooked-for southern locality—Texas—and a new one with an impossible fruit from Oregon) had better be referred back to their authors for further investigation." Discretion on the part of the editor is due as well to his correspondents as to his readers, and we take on ourselves, with humility, this censure for over-haste in publication.

45. **The Discoverer of Arceuthobium.**—We notice in the *American Journal* for June, that Dr. Gray, misled by us in our first notice, mistakes the title of this lady. It should be not Miss, but Mrs. L. A. Millington.

46. **Catalogue of the Plants in Central Park.**—This catalogue was made by men of botanical repute, but not intimately acquainted with our flora. We have already had occasion to notice one error; another has been lately brought before us. The *Asclepias parviflora*, Pursh, Mr. Pollard shows from the specimen to be an *Apocynum*. We hope Mr. P. will go over the whole collection, and verify it. We doubt, now, the *Carya sulcata*, Nutt., reported in our last number.

47. **A Hint on the Examination of Plants.**—The inquiry on page 48 of the last volume of the BULLETIN (Dec., 1871) induces me to mention the following method for making sections of small seeds in order to examine the embryo, or cross sections of leaves, anthers, small twigs, etc., in order to examine their structure. I refer to the method of *embedding*, which is by no means new, but may be novel to some of the readers of the BULLETIN.

The necessary materials for the process may be found in almost every house, and consist of a teaspoon and a portion of a spermaceti candle. Break off pieces of the candle and melt them in the spoon over gas or a spirit lamp. When the spermaceti is melted, allow the spoon and its contents to cool, until the latter begin to congeal; then embed in the congealing mass the seeds or whatever else it is wished to examine, and set the whole aside till cold. Finally, by passing the spoon a second time once or twice over the flame, the cake which it contains may be removed, and with a sharp razor thin sections may be made of the mass and its contents for examination under the microscope. In this manner better sections can be made than by holding the object between two pieces of cork.

The above is the simplest way. A more elegant mode is to employ a mixture of white wax and olive oil, about half and half (but

the proportions may be varied according to the desired degree of firmness), melt them in a small cup over a Bunsen's burner, and pour the fluid into a little mould, made by turning up the edges of a common visiting card. F. J. B.

VIENNA, May, 1872.

48. **Helonias bullata.**—The note in the May BULLETIN, by I. H. H., upon the sparse flowering of *Helonias bullata* records a different experience from that of others. Last fall I received a number of the plants from a lady who lives near the Pine Barrens. She wrote: "The most marvellous sight I ever beheld was two or three acres of these plants in the height of their glory," which would indicate that your correspondent had fallen upon an unfavorable locality. Some twenty or thirty of the plants sent by her I placed in a cold frame, where they passed the winter under a slight covering of leaves. This spring they bloomed freely. After reading the remarks of I. H. H., I inspected the plants, and found that quite half of them had flower-stalks remaining, and, as a number had been cut for drying and for showing to others, I am safe in saying that more than half of the plants, large and small, bloomed. It may be the case with Helonias as with some other marsh plants, that it does better in dry ground than its native locality, or it may be that so marked a change as that, from the swamp to garden soil, threw plants into flower that would not have bloomed if left at home. At any rate, here are the facts. G. T.

49. **New Localities.**—Last season I found **Phlox pilosa** in abundance near Passaic, N. J., and also two specimens of **Vaccaria vulgaris.** **Trollius laxus** occurs in abundance in this vicinity, and I learn that A. S. Fuller, of Ridgewood, N. J., found a single specimen of **Rhodora Canadensis.** G. C. WOOLSON, 245 Broadway.

50. **Strangers.**—I have lately found growing plentifully and seemingly as well established as any native plant in their vicinity: **Hieracium murorum, L.**; **Veronica chamaedrys, L.**; **Ajuga reptans, L.**

They grow near each other, and have all probably sprung from English seeds scattered within the past few years. They are thriving among bushes and grass, like native plants, in an unimproved portion of the Prospect Park grounds. J. S. M.

51. **Note.**—On an excursion to Staten Island a couple of weeks ago, in quest of *Clematis ochroleuca*, I found right in the thicket, where Clematis grows, a clump of **Amorpha fruticosa, L.**; Var. **Lewisii** It had last year's fruit still remaining. I. H. H.

ERRATA.—p. 26, l. 13, for "Draba vera," read "Draba verna;" p. 28, l. 20, for "Le Roy," read "*Le Roy.*"

Terms—One dollar for one copy; five dollars for seven; and half a dollar for every additional copy, per annum.

Local Herbarium, 3, E. 33d St.—Editor, 224, E. 10th St.

The Club meets regularly the last Tuesday of the month in the Herbarium, Columbia College, at 7½ P.M.

52. **The Flower of Yucca and its Fertilization.**—The flowers of all the species are more or less pendulous, open towards evening, and remain wide open through the night and half close in the morning, continuing in that condition until one or two days afterwards, when they drop off, or, if fertilized, wither and become erect. The sagittate anthers open a little before the flowers do, curve backward, and contract to about one-fourth their former size, and thus expel the heavy, somewhat gelatinous pollen-grains, which remain in different little lumps within the flowers. What we usually call the stigma is the style, or rather, the three styles; these together form the stigmatic tube, their edges conniving and their inner sides, the inner coating of the tube, exhibiting the stigmatic surface. This tube is directly connected with the ovarian cells. The pollen, introduced into the tube, begins to develop and to enter upon its functions. But, without artificial aid, it never gets into it. Nocturnal insects are the agents—in our gardens, at least, a white moth of the genus Tortrix. If, about sunset, when the flower is fully open, we take up the pollen-lumps from the flower, and, with a camel-hair brush, well introduce them into the stigmatic tube, we may supply the action of insects wanting in Northern or European gardens, far away from the native home of the Yuccas, and succeed in producing fruit and seed, which thus far are almost unknown in cultivation.

St. Louis, June, 1872. Dr. George Engelmann.

53. **Botrychium matricariæfolium**, A. Braun.—I send you a couple of specimens of this fern, from a locality in the neighborhood of Utica which I found last summer.

I sent specimens to Prof. Eaton, who pronounced it *B. matricariæfolium*, and stated that he had received it from Lake Superior, and from Susquehannah Co., Pa. He also stated that almost the same thing was found in this vicinity several years ago, by Mr. Paine, but that the specimen sent him by Mr. Paine was so imperfect that he passed it over as a form of *B. lanceolatum*.

I have not conferred with Paine about it; but, as he says nothing of it in his catalogue, it seems fair to conclude that he did not know of this locality.

It grows on the sides of a shady ravine some four miles from the city. I found growing side by side with it; *B. Virginicum*, Swartz; *B. Virginicum*, var. *gracile*, Pursh; *B. lunarioides*, Swartz; *B. lanceolatum*, Angstroem.

The specimens I send were gathered June 29, 1872. The locality is quite limited in extent, but the plant seems abundant. Why has not Prof. Eaton described this species in the Manual? It is the same as Wood's *B. neglectum*, of course.

I found quite a curiosity at the Mud Lake Swamp (Paine's Catalogue) a few days ago—several specimens of *Cypripedium spectabile*, Swartz, with the labellum double, the two being quite distinct throughout, and about two-thirds the size of the ordinary flower, and all the other parts of the flower single. Edwin Hunt.

Utica, N. Y., July 7, 1872.

54. **Bees puncturing Flowers.**—This spring we received from Lewis

Co., N. Y., a package of *Dicentra cucullaria*, DC., the spurs of which had been perforated and cut by humble-bees. We take the liberty of making extracts from the letter of the lady who sent them. "C. went to the woods, and spent several hours watching the bees. The woods were full of Dicentras this spring. He could not find a spike of any species on which there were not one or more punctured flowers. He said the bee lighted on the lowest flower, cut a small hole in the spur with his mandibles, inserted his proboscis, took a sip of the honey, then proceeded to the second flower, where the same operation was performed; then to a third, when he captured him. [The bee was sent us.] He saw several humble-bees performing this labor, and many honey-bees sucking the honey; but in no instance did he see the honey-bee make the incision, and these were the only insects which visited the flowers during his stay. My *Dicentra spectabilis* and *D. eximia* are now in full bloom. The flowers are greatly disfigured by these punctures. Yesterday I observed a bee for a long time while taking his dinner. The spurs of three or four of the lowest flowers on the long racemes were already punctured. He would fly to a flower, place his feet on each side of the spur, either to press up the honey or to 'hold on' better, insert his tongue for a few seconds, and then fly to the next. Every insertion of his tongue enlarged the orifice; but in no case did he make a fresh incision until the supply of nectar was apparently exhausted. Then, with his strong mandibles, he would nip a hole in a perfect flower as quickly as you could with a pair of scissors. They appeared to know the exact moment when the flower was full-grown and the honey secreted." . . . "The insects, as far as I can discover, do not visit the Adlumia and Fumitory."

55. **Fertilization of Asclepias.**—I notice in the July No. of the *American Agriculturist*, in an article on this subject, the statement that "the point where the filaments or strings which connect them [the pollen-masses] join is very sticky." In the *American Naturalist*, Vol. I., pp. 69, 71, the gland is called "viscid" and "adhesive." In Vol. II., p. 665, of the same work, the pollen is said to adhere "by a glutinous substance." In Vol. III., p. 109, J. Kirkpatrick, who seems to have looked carefully into the matter, attributes the adhesion to the fact that "a hair or claw [?] entering the cleft becomes fast." That this is the case, my own observations, as given on p. 388 of the same volume, confirm. I have never noticed any adhesiveness on the outside of the gland. If a very fine hair is drawn through the cleft, it is caught and lifts out the pollen; but if the hair be too coarse to enter the cleft, I have never found it to adhere to the outside. The fibres of cotton, or the fine long hairs on many plants—the Asclepias itself—are best for this experiment—none more so than the long, separate hairs on the petiole of *Ambrosia artemisiæfolia*. I have never been able to determine how the hair is held in the gland, whether by some viscid substance contained in it, or by mechanical pressure, and would gladly learn. There is one fact connected with this subject which I do not remember to have seen noticed, and which makes the analogy between the Asclepiads and

Orchids still closer. When the pollinia are drawn out of their pockets they lie in the same plane, but in a short time twist about so as to be in parallel planes. In this position, what may be called the knees of the mass are turned to the side opposite to the groove, and present to the cleft of the stigma, when the insect alights, what was before the outer edges of the mass. When moistened with warm water, the pollinia resume their original position. This last experiment I made with the pollen of *A. Cornuti*, Decaisne.

W. H. L.

56. **New Publications.**—1. *Botany for Young People.* PART II. *How Plants Behave: How they Move, Climb, Employ Insects to Work for them, etc.* By Asa Gray. New York and Chicago: Ivison, Blakeman, Taylor & Co.

As the title, given in full, indicates, this little work brings together a class of facts constituting a new and most important chapter in Botany. It was time for the separate observations to be combined and the results introduced more directly to the student, and we are rejoiced to learn that Dr. Gray proposes a fuller statement of them. The book is attractive in form, and we hope may lure the young to our favorite study. To more mature minds, imbued with a love of Nature, it cannot fail to prove of great interest. We find a little obscure the brevity of the account of the insect fertilization of Iris, and venture to question the dictum that such plants as *Silene* and *Robinia viscosa* capture insects by accident.

2. *The Bee-Keeper's Magazine: an Illustrated Monthly.* H. A. King & Co., 14 Murray street, New York.

57. **Agave Americana, L.**—A fine specimen of the so-called Century-plant has been on exhibition in this city during the last month. The great heat seems to have hastened its blooming, so that we fear it may be too late for our readers to profit by this notice.

58. **Salices.**—We have omitted the continuation of the Catalogue this month, in order to make a final appeal for help with these Willows. We do not suppose that any one is free from doubts on this subject; but whoever has studied it at all must have determined some of the species described in Gray's Manual, or at least must have some specimens from our vicinity. We want every ray of light. In particular, we have no information about *S. humilis*, Marshall; *S. purpurea*, L.; *S. viminalis*, L.; *S. cordata*, Muhl.; the varieties of *S. fragilis* and *S. alba*, L.; *S. longifolia*, Muhl. Doubtless some or all of these species are to be found hereabouts. No genus of plants is more puzzling, and very good service may be rendered to science in this direction.

59. **Pinus Elliottii, Engelm.**—Mr. H. W. Ravenel has kindly sent us additional specimens (which we have placed in Dr. Torrey's herbarium), and writes: "You will observe the early recurving of the young cones, which seems to be characteristic of the species. Dr. Mellichamp, of Bluffton, S. C., near the sea-coast, from whom I received them, says in his letter of April 30th—'Some weeks ago the young cones were standing off like the arms of a cross, the whole

outline of the tree presenting these innumerable little crosses against the sky, but now they are all turned downwards.' It thus appears that in this species the young cones recurve a few weeks after flowering. In *P. glabra*, Walt., this takes place during the first summer's growth, as I have specimens collected in November, with the spring fruit recurved. In some species they remain erect or at right angles, and in others recurve at the beginning of growth of the second season. This peculiarity is worthy of more attention, as it may furnish important specific characters.

"I enclose also a sprig of *P. glabra*, exhibiting the true leaves very finely. You will observe that, while the true leaves are unusually well developed, the phylloid shoots are mostly wanting in their axils, and that the leaves are finely serrulate, while the phylloids are smooth and have entire margins.

"I also send some fruit of the very rare and curious *Carya myristicæformis*, Mch., found in swamps in the seaboard districts of this State."

60. **Hottonia inflata**, Ell.—I have recently found this rather rare plant in such quantities, and so near New York, as perhaps to render the locality worthy of record. It grows by the roadside, about a mile east of Woodridge Station, on the Hackensack branch of the Erie R. R. The ditch is completely covered with it for several rods in length. Near it is also found **Glyceria acutiflora**, Torr., in abundance.

Bromus sterilis, L., is very abundant about cultivated grounds near Passaic, N. J., and in timber lands **Asclepias quadrifolia**, Jacq., together with **A. phytolaccoides**, Pursh. **Chamælirium luteum**, Gray, grows between Hackensack and Lodi, N. J., though not plentiful.

I found this spring, on Todt Hill, Staten Island, a white variety of **Silene Pennsylvanica**, Mchx. All the plants I found had white flowers. G. C. W.

245, Broadway.

61. **Broussonetia.**—A few days since, walking down through the Park, between 10 and 11 o'clock A. M., I saw numbers of Broussonetia trees, in full flower, very cloudy with exposive puffs of pollen, as noticed by Prof. Martin in a last year's number of the BULLETIN. I picked up a catkin, just blown off by the wind, and some puffs appeared as I held it in my hand. I. H. H.

June 3d.

62. **New Localities.**—**Mentha aquatica**, L., var. **crispa**, Benth., at Tarrytown. **Geranium Robertianum**, L., in the cedar groves on Rockaway Beach, *W. H. L.* **Ægopodium podagraria**, L., waste places, Prospect Park, *Merriam.*

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63. Note from Dr. Engelmann.—Your July BULLETIN is just received. Did I write so indistinctly that you could have made out the *glutinous* pollen *gelatinous*? Who ever has seen gelatinous pollen?

Of minor importance, is that you made me refer the moth in question to the *Genus Tortrix*. I undoubtedly said "*allied* to Tortrix. Our State Entomologist, Prof. Riley, has examined the moth, and found it to belong to Tineidæ, and to constitute a new and distinct genus. The same is found wherever capsule-bearing Yuccas grow. The larva lives on the growing seeds, fertilized by the exertions of its mother, bores through the yet green rind of the full grown fruit, and enters the ground. I have received it now from South Carolina, whence Dr. John K. Mellichamp, the discoverer of Pinus Elliotti, sends it; and from Texas, where Mr. Elihu Hall has found it. Dr. Mellichamp has won laurels in the zealous investigation of the flora of his region, and has furnished me, in the most amiable manner, valuable material and notes for my botanical studies, especially as far as regards Coniferæ and Yuccas.

Scarcely any Yucca capsule is seen without one or more holes in it made by the escaping larvæ, and part and sometimes all of the seeds are sacrificed to obtain the fertilization of the ovules.

Your notice of the Agave has made me think of your letter. I had mislaid and forgotten it. I should like to obtain, if yet time, a bunch of flowers, fresh, sent by mail in a box.

You will observe a fact, interesting in many points, in the flowers and fertilization of Agave. When the flowers open and the anthers shed their pollen, the style is yet quite short, often hidden within the flowers, and the stigma closed. Only the following day, after the anthers are effete, or have even fallen off, the style lengthens and usually attains the height of the filaments, when the three lobes of the stigma expand, ready to receive the pollen of the younger flowers opening now above them. Agave is, therefore, proterandrous; descriptions mentioning the length of the style must be cautiously considered; and figures which represent style and stamen equally developed are necessarily erroneous.

I wish I could obtain a bunch of flowers, and regret much, not having written at once. Capsules and seeds will also be acceptable.

ST. LOUIS, July 29th, 1872.

[When we received Dr. E.'s letter it was too late for the Agave. We publish his request in hopes that some one else may be able to respond.—EDS.]

64. Yucca.—In Dr. George Engelmann's notes on the fertilization of the *Yuccas*, in July BULLETIN, he says: "The fruit and seed are *rare*; indeed, almost unknown in cultivation in Northern gardens;" and also, "Without artificial aid, the pollen never reaches the inner or stigmatic surface of the tube, &c."

In my own garden, the *Y. filamentosa*, Gray, blooms and matures its seed annually. I have never been able to discover the intervention of any insect to assist fertilization, nor have I ever failed to secure the prompt germination of seed taken from any well-matured capsule. J. W. B.

FLUSHING, L. I.

65. **Trees and Rain.**—The influence of trees upon rains and the general moisture of the atmosphere, which has been so much discussed of late, receives a strong illustration from the island of Santa Cruz, W. I.

A friend who spent the months of February, March and April last upon the island, informs me that, when he was there twenty years ago, the island was a garden of freshness, beauty and fertility. Woods covered the hills, trees were everywhere abundant, and rains were profuse and frequent. The memory of its loveliness called him there at the beginning of the present year, when, to his astonishment, he found about one-third of the island, which is about twenty-five miles long, an utter desert. The forests and trees generally had been cut away, rain-falls had ceased, and a process of desiccation beginning at one end of the land had advanced gradually and irresistibly upon the island, until for seven miles it is dried and desolate as the sea-shore. Houses and beautiful plantations have been abandoned, and the people watch the advance of desolation, unable to arrest it, but knowing, almost to a certainty, the time when their own habitations, their gardens and fresh fields, will become a part of the waste ; the whole island seems doomed to become a desert.

The inhabitants believe, and my friend confirms their opinion, that this sad result is due to the destruction of the trees upon the island some years ago. J. S. M.

66. **New Stations.**—**Polanisia graveolens**, Raf. ; **Lythrum Salicaria**, L. ; **Asclepias verticillata**, L., found abundant along the Hudson R. R. R., at Fort Montgomery Station, a few miles below Garrison's. **Liatris spicata**, Willd., between Fort Montgomery and Garrison's, about opposite Gov. Fish's residence. J. S. M.

July 31.

67. **Note from Prof. Thomas C. Porter.**—If Budd's Lake, Morris Co., N. J., is within the circuit embraced by your BULLETIN, and it may be, being less than fifty miles from New York, I can report as growing there, and can furnish specimens of, *Salix myrtilloides*, *S. candida* and *S. lucida*—also, *Betula pumila*. A number more of interesting plants occur there, and the point is well worth a visit from the members of your Club. It is very easy of access, and there is a good hotel on the border of the Lake. It lies only 2½ miles south of Stanhope Station on the Morris and Essex R.R. Lake Hopatcong, which is still further east, can boast of possessing, on the sandy margin of its largest island, the rare *Juncus subtilis*, Mchx. (*J. pelocarpus*, var. *subtilis* (?), Engelm.). I collected it there some years ago on the 25th of September, not in fruit.

EASTON, Pa.

68. **Silver-leaf.**—This name we found given in Greene Co., N. Y., to the common Balsam, *Impatiens fulva*. Some one had noticed that when the fresh leaves are immersed in water the underside reflects the light as from a surface of silver-foil. But many other leaves, those of Dogbane for example, exhibit the phenomenon in nearly equal perfection. The surface of these leaves is not wet by the

water, as may be seen by withdrawing them. The reflection, then, is from the surface of water next the leaf. The brilliancy of dew-drops is owing to a like cause. The experiment is a pleasing one. If our explanation is defective, we should be glad to have the deficiencies supplied.

69. **Hypericum Canadense, L., var. major, Gray.**—On wet hill-sides in the Town of Windham, Green Co., N. Y., grows a very marked form of this plant, the leaves being frequently 4½ lines in width. The typical form does not occur in that vicinity, though found near the Mountain House. *Carum Carui*, L., grows spontaneously along the roadside in East Windham.

70. **Publications received.**—1. *Grevillea*, No. 1, with a colored plate, gives much space to American Cryptogams; to the publication here of most of them we have already referred. A new contribution is *Peziæ Americanæ*, by M. C. Cooke and C. H. Peck.

2. *Archives of Science*, No. 5, McIndoe's Falls, Vt., contains the commencement of a catalogue of Vermont plants, *Ranunculaceæ* to *Fumariaceæ*. The most curious item, however, belongs to New Hampshire: *Clematis Viorna*, "found abundantly just across the Connecticut river from Brattleboro', on Wantasetiquet Mountain, on a sheltered southern slope, by C. C. Frost." Another article, *Botanical Notes*, by Prof. Ed. T. Nelson, of the Ohio Wesleyan University, on Mistletoe and Trillium, is of interest to botanists.

3. Circular of a *New Botanical Check List*. "It will include the Phænogamous and Acrogenous plants of that portion of North America . . . embraced in Gray's *Manual* and Canada." Address, A. H. Curtiss, Liberty, Bedford Co., Va.

4. The Article "*On the Cause of the Deterioration in some of our Native Grape-Vines*," by C. V. Riley, in the September No. of the *American Naturalist*, contains Dr. Engelmann's elaboration of the "*Grape-Vines of the Old United States*." In the August No. is a notice of a wild double-flowered state of *Saxifraga Virginiensis*, Mchx. We have a specimen gathered in Greenburgh, Westchester Co., N.Y., in 1858.

5. *Nature*, July 11, 1872 (No. 141, Vol. 6), contains the memorial of Lyell, Darwin, Bentham, and other eminent scientific men, to Mr. Gladstone, in reference to the disgraceful interference of a Mr. Ayrton with Dr. Joseph Hooker. This Ayrton happens to hold the office of First Commissioner of the Board of Works, and treats his official subordinate Dr. Hooker in a way that threatens to drive him from his most useful position. Mr. Ayrton, in his self-conceit, seems not to be aware that England would be in a sad state of decay if she had not many men better qualified for his office than he is, but if Dr. Hooker should be displaced, there could not be found another to fill the vacancy. "*Nature*" is constantly pressing the union of State and Science, but such experiences as that of Dr. Hooker in England and Mr. Parry in this country are not encouraging.

71. **Westchester County Plants.**—Dr. S. B. Mead, of Augusta, Hancock Co., Illinois, has sent us a list of plants which he gathered many years ago in Westchester Co., N. Y., and Greenwich, Ct. We select some of the most notable. **NORTH SALEM:** *Clematis verticillaris*, DC.; *Ranunculus abortivus*, L., var. *micranthus; Coptis trifolia*, Salisb.; *Dentaria diphylla*, L.; *Acer dasycarpum*, Ehrhart (Croton River); *Myriophyllum tenellum*, Bigelow; *Viburnum opulus*, L.; *Liatris scariosa*, Willd.; *Solidago rigida*, L.; *Hottonia inflata*, L.; *Castilleia coccinea*, Spreng.; *Dirca palustris*, L.; *Celtis occidentalis*, L.; *Abies nigra*, Poir.; *Arethusa bulbosa*, L.; *Liparis liliifolia*, Richard; *Aplectrum hyemale*, Nutt.; *Trillium erythrocarpum*, Michx. (Peach Pond); *Chamælirium luteum*, Gray; *Juncus pelocarpus*, E. Meyer; *Pontederia cordata*, L., var. *angustifolia* (Peach Pond); *Schollera graminea*, Willd. (Croton River); *Eleocharis quadrangulata*, R. Br. (East Long Pond). **PEEKSKILL:** *Polanisia graveolens*, Raf.; *Elatine Americana*, Arnott; *Tillæa simplex*, Nutt.; *Crantzia lineata*, Nutt.; *Limosella aquatica*, L., var. *tenuifolia*, Hoffm.; *Sagittaria pusilla*, Nutt. **GREENWICH:** *Reseda luteola*, L. (roadsides); *Tussilago Farfara*, L.; *Hottonia inflata*, L. (He found this plant before the year 1820); *Galeopsis tetrahit*, L.; *Hyoscyamus niger*, L.; *Quercus obtusiloba*, Mchx.; *Aplectrum hyemale*, Nutt. **RIDGEFIELD**, Ct.: Tamarack swamp, about 2 miles from N.E. corner of Town of North Salem: *Aralia hispida*, Mchx.; *Andromeda polifolia*, L.; *Kalmia glauca*, Ait.; *Nemopanthes Canadensis*, DC.; *Orontium aquaticum*, L.; *Xyris flexuosa*, Muhl., Chapm.; *Eriophorum alpinum*, L.

72. **Trip to Staten Island.**—Herborizing with a friend, early in July, we were struck with the frequency, near Tottenville, of **Diospyros Virginiana**, L. We saw some bushes of **Pinus inops**, Ait., almost stripped of their leaves by caterpillars. The most abundant growth of **Apocynum cannabinum**, L., that we have met with near the city, was just beyond Red Bank Light, along the shore, the nearest R.R. station being Pleasant Plains. **Tecoma radicans**, Juss., is perfectly at home here, spreading over the sand, and climbing the bushes, particularly a group of self-sown **Ailanthus glandulosus**, Desf., which was in a blaze with the showy trumpets. The shore in the same locality was covered with **Artemisia candata**, Mchx., which has not before been reported from the Island. We picked up a pretty sound twig or root, into a minute crevice of whose bark some grass (*Calamagrostis arenaria*, probably) had inserted its fibrous root. The fibre had passed between the bark and wood, and had found its way out some inches away on the other side. The openings in both cases were so perfectly filled by the fibre of the grass root, that it seemed to have bored its way through the hard bark, which must have been one-sixteenth of an inch in thickness. My companion had often noticed similar appearances in the Northern woods.

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73. **Notes by Mr. Hall.**—It is well known that the name *Bugloss* comes from the Greek *βουγλωσσος*, and means "Ox-tongue;" but Dioscorides relates (I have not the work at hand, and cannot remember precisely the place) that the Greek name is only a translation of the Phenician "*Haleshon Eleph*," a name the Carthaginians applied to an herb they used medicinally. The name, any Hebraist will immediately see, means "the tongue of ox," or as we would say, "the ox-tongue."

Some years since, I found in Sennet, Cayuga County, a number of exceedingly large specimens of *Phegopteris hexagonoptera*, Fée. On burning some broken pieces, after I had dried them, I noticed that instead of leaving an ordinary ash, each piece left a white globule of nearly pure carbonate of potash. I then took a whole frond and set one end on fire, holding the other, when a little white globbule of KO,CO_2 followed up the burning end, hissing and boiling and increasing as it went on, and attaining the size of a very large pin-head by the time the frond had burned up to my fingers; but no other ash appeared. I repeated the experiment several times with the same result, and have since tried specimens from other localities, and have often found that the fern would thus burn entirely up, with nothing solid left but a white globule of carbonate of potash. How pure the salt was I cannot say, as I only satisfied myself of its main character. I ought to mention that the soil in which the specimens first mentioned grew was mainly formed of decayed wood.

74. **The Willows of Amherst, Mass.**—All the common species are abundant, six or seven sometimes being in close proximity.

Salix discolor shows its catkins soon after the first of April, and is rapidly followed by *S. humilis*, *tristis* and *sericea*, these by *S. livida* and *cordata*, and still later by *S. lucida* and *nigra*. Several varieties of *S. fragilis* and *alba* are cultivated for hedges and other purposes. *S. myrtilloides* is found in adjoining towns, and *S. longifolia* on the Connecticut river farther north.

It is important that the place each species holds in Anderson's arrangement should be known, but it is sufficiently puzzling to assign each its place according to Gray's Manual, and the more so, as the term "species," in many cases, really means "group," and often a very comprehensive one.

1. *Salix discolor*, Muhl., as found here is reasonably constant as described, and the ordinary forms are readily recognized in flower. The mature leaves occasionally retain some pubescence beneath, and can hardly be told from the similar leaves of *S. humilis* except by their being serrate. Old bushes have often exceedingly small leaves.

2. *Salix humilis*, Marsh., seems to be a convenient name for all the protean forms occurring between undoubted *S. discolor* and *S. tristis*.

One form, with slender, dark twigs and thin leaves, growing in the shade, is very like *S. discolor*. A second, with vigorous, gray, downy shoots, numerous and thick leaves, very woolly beneath, and

with large stipules, cannot be mistaken, while by the side of it is a third, with smooth yellow twigs, whose leaves alone determine it.

Still another form has narrow leaves, much like those of *S. tristis*, though thinner and less hoary, while the catkins are very small and globular, and might make a pretty good species.

3. *S. tristis*, Ait., is less common than the preceding, which is always found in close proximity. It grows in large, low clumps, with slender shoots often two or three feet in length, and has a less upright habit than any other. The ordinary form is readily detected, but the connection between these last two species is so close that the distinctions given seem to be more of degree than of kind.

4. *S. sericea*, Marshall, is plainly marked. Does its allied species *S. petiolaris*, Smith, occur in New England, and are they more than varieties of one typical form?

5. *S. cordata*, Muhl., is another polymorphous group. The broad, cordate leaves are more common on the thrifty shoots, and a beginner may as well forget that the name has any significance, as he gathers the narrow lanceolate leaves, often the only ones to be found. The fruit is the only constant quantity.

6. *S. livida*, Wahl., var. *occidentalis*, is usually true to its name, though the leaves vary greatly in hoariness, the prominent veins however remaining. Like *S. discolor*, when old or stunted, its very small leaves render it easy to confound the two.

7. *S. lucida*, Muhl., is widely distributed through the town, but occurs mostly in single bushes, and those nearly all staminate. The form with broad leaves, somewhat glutinous and drying dark, is the most common. The other, with lanceolate and thicker leaves, somewhat pubescent beneath, is less abundant. It is our most elegant willow.

8. *S. nigra*, Marsh., is common and without much variation.

9. *S. fragilis*, L. There are two and perhaps three varieties found in the hedge-rows.

10. *S. alba*, L., var. *vitellina* and var. *cærulea* both occur, but as the staminate trees are not cultivated it is not easy to get complete herbarium specimens, or study any introduced willows to advantage. Perhaps some benevolent botanist will offer to supply this defect in our collections.

The *Manual* tells us *S. livida* has its anthers frequently transformed into imperfect ovaries. This is true also of *S. humilis*, *discolor*, and *cordata*. The "*cordata*" ovaries are quite perfect and make the bush look as if in full fruit. H. G. Jesup.

75. **Humming-bird.**—I was reminded the other day of the story told by Pliny, of the painter Zeuxis, who represented a bunch of grapes so naturally that the birds flew at the picture to eat the fruit. My friend, Mrs. P. W., told us that a gentleman, the Rev. Mr. P., was sitting on the piazza of her house with his feet encased in a pair of worked slippers, adorned with some highly-colored flowers, and that she saw a humming-bird repeatedly pick at the flowers, in the

vain attempt to find in them his accustomed nourishment. This curious fact seems to indicate that the attraction in such cases is not due to the odor of the flowers, but simply to their bright color; and that the Greek story is not so improbable after all. C. D. M.

76. **Actæa**, L.—I have been interested this summer in the examination of the Actæa—both red and white—of which I saw hundreds of fine plants. It is impossible to mistake the one species for the other, without regard to color of berries.

The red berries (*A. spicata*) have very delicate, long, green pedicels, $\frac{3}{4}'$. The berries are a half larger than the white, and the stalks *are hollow, and easily crushed* with the thumb and finger.

The long pedicels give to the head much of the ovoid shape mentioned in the books as opposed to the oblong heads of the white.

A. alba has berries small, $\frac{1}{3}'$, and generally white, though I found several red, but it was as easy to distinguish them from *A. spicata* as if they had been white. The pedicels are $\frac{1}{2}'$ long, and very thick and red, and, in contrast with the white berries, produce a very pretty effect. The *stalks are solid*, occasionally having a fine thread-like hollow at the centre, but are *never easily crushed* with the fingers. This distinction is very remarkable. I probably examined more than 100 stalks, and brought some with me showing this difference. I found it everywhere the same.

The small *red* berries on thick, short, red pedicels were as clearly the *A. alba* as the white ones; they had every characteristic but color, and that of a very different shade from the *A. spicata*.

This circumstance has made me doubt the observations on which is made the statement, "white berries sometimes occur on slender pedicels, and vice versa," for in my case, though "vice versa," they were not *A. spicata* in any sense. The white is generally of a more slender habit than the red, and taller, but I should find it difficult, if not impossible, to distinguish them except in fruit, and then it is impossible to confound them, and I make no doubt as to their being distinct and well-defined species. J. S. Merriam.

77. **White Partridge Berries.**—We found last week a good many *white* partridge-berries (*Mitchella repens*). We have never noticed them before, and would like to know whether they are common; if so, we are not close observers. They were growing with the red berries, but not on the same vines. They were larger than most of the red ones. We thought at first that they were unripe berries, but they cannot be, for there were quantities of green ones which did not look at all like these. We find no mention of them in Gray's Botanies.

Canaan, Ct., Sept. 11th. S. W. A.

78. **Aspidium Thelypteris**, Swartz.—Mrs. L. A. Millington finds this fern to be quite fragrant in drying. She writes:—"I think we shall have to call it a variety, as not all that I have examined have proved to be fragrant. The fertile fronds are somewhat less rigid, and the whole plant softer and lighter colored. I find that it has been known among country people as *Beaver-meadow fern*. Marshy

bits of meadow smell deliciously of it in autumn. Before I knew of its fragrance, I have looked them over and over for vernal grass. I discovered that it was a fern four years ago at New Pond, in Elizabethtown (Essex Co., N. Y.)."

Fungi.—Mrs. M. adds :—"The season has been very wet, and the woods swarm with fungi. The leaves on the forest trees were blighted by them so much that whole patches of hillside covered with deciduous trees looked as if fire had run through them. I saw fine trees with foliage turned yellow, owing to a fungus with brown, powdery spores, which grew under the smooth bark of the lesser branches. The Balsam Fir has a curious fungoid growth which is so like in effect to Arceuthobium that it is hard to tell them apart till you handle them. I have not found the Arceuthobium on the Balsam as yet."

79. **Willows and Poplars.**—We are indebted to the Rev. H. G. Jesup for a very fine suite of specimens of the Amherst willows. Our own collectors seem generally to have neglected these two genera, and our materials have consequently been very meagre.

80. **Rhyncospora nitens**, Gray.—This southern form has been detected at Long Pond, Wading River, L. I., by Messrs. Young and Miller.

SALICACEÆ.

Salix, Tourn.—**S. candida**, Willd.; found in all our districts; N. Y.—**S. tristis**, Ait.; Long Island; Staten Island; South Amboy.—**S. humilis**, Marshall; Hunter's Point, *Allen*; Harlem River, *W. H. L.*; Glen Cove, *Coles.*—**S. discolor**, Muhl.; everywhere common; N. Y.—**S. sericea**, Marshall; Westchester Co.; Bergen Point.—**S. petiolaris**, Smith; reported from Westchester Co., and New Durham Swamp, but the specimens are not decisive.—**S. viminalis**, L.; cultivated in N. J.—**S. cordata**, Muhl.; rather common, particularly the narrow leaved forms.—**S. livida**, Wahl., var. **occidentalis**; rather common.—**S. lucida**, Muhl.; common.—**S. nigra**, Marsh; N. Y., banks of Harlem River and Westchester Co., where is found the var. **falcata.**—**S. fragilis**, L.; N. Y. and Westchester Co.—**S. alba**, L.; Glen Cove, *Coles*; var. **vitellina**; common on and about New York Island.—**S. Babylonica**, Tourn.; common in cultivation.—**S. myrtilloides**, L.; Budd's Lake, N. J., *Porter.*

POPULUS, Tourn.—**P. tremuloides**, Mchx.; common; N. Y.—**P. grandidentata**, Mchx.; common; N. Y.—**P. heterophylla**, L.; not uncommon; swamps, Bloomingdale, *Torr. Cat.*—**P. balsamifera**, L.; var. **candicans**; common in cultivation.—**P. nigra**, L.; was formerly reported (*Torr. Cat.*) on the Hackensack road near Hoboken. We have heard nothing of it of late.—**P. dilatata**, Ait.; still lingers on old grounds.—**P. alba**, L.; much cultivated.

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CONIFERÆ.

PINUS, Tourn.—**P. rigida**, Miller; common.—**P. inops**, Ait.; Long Island, *LeRoy;* Staten Island, *LeRoy, Leggett;* New Jersey.—**P. mitis**, Mchx.; New Jersey, *State Flora.*—**P. resinosa**, Ait.; Inwood, N. Y. Island, *LeRoy.*—**P. Strobus**, L.; common; N. Y.

ABIES, Tourn.—**A. nigra**, Poir.; "As far south as New York," *State Flora;* New Durham Swamp, *Torr. Cat.;* Secaucus Swamp, *W. H. L.;* Palisades, very rare, Orange Co., *Austin.*—**A. alba**, Mchx.; Orange Co., *Austin.*—**A. Canadensis**, Mchx.; not uncommon; N. Y.

LARIX, Tourn.—**L. Americana**, Mchx.; New Durham Swamp; Passaic River; Closter, *Austin;* Westchester Co., Yonkers, *Pooley;* Harlem River, *Ruger.*

THUJA, Tourn.—**T. occidentalis**, L.; "Rocky banks of the Hudson, New York and New Jersey," *Torr. Cat.;* Spuyten Duyvel, N. Y.; Closter, scarce, *Austin;* Glen Cove, *Coles;* Yonkers, *Pooley.*

CUPRESSUS, Tourn.—**C. thyoides**, L.; Swamps, Long Island, *State Flora;* New Durham, Secaucus, &c., N. J.; Westchester Co., *Pooley;* Peach Pond, Putnam Co., *Dr. Mead in State Flora.*

JUNIPERUS. L.—**J. communis**, L.; Fishkill, *Torr. Cat.*; Glen Cove, *Coles;* Wading River, *Miller;* Closter, common, *Austin;* these stations have commonly the prostrate form (var. depressa, *Torr. Cat.*) the upright form is common about Dickerson, Morris Co., N. J., and about the Water-gap, Pa., *Austin.*—**J. Virginiana**, L.; common; N. Y.

TAXUS, Tourn.—**T. baccata**, L.; var. **Canadensis**; Manhattanville, *Menard in State Flora;* Palisades, common, *Austin.*

ARACEÆ.

ARISÆMA, Martius.—**A. triphyllum**, Torr.; very common in rich woods.—**A. dracontium**, Schott; LeRoy; Orange Co., *Austin.*

PELTANDRA, Raf.—**P. Virginica**, Raf.; not uncommon; New Durham Swamp; common on Long Island, *Ruger.*

CALLA, L.—**C. palustris**, L; New Durham Swamp, *Torr. Cat.;* Orange Co., *Austin.*

SYMPLOCARPUS, Salisb.—**S. foetidus**, Salisb.; very common; N. Y.

ORONTIUM, L.—**O. aquaticum**, L.; in creeks and swamps, Bergen, *Torr. Cat.;* New Durham; Closter, *Austin;* Jamaica, &c., *Allen;* Red Bank, N. J., &c.

ACORUS, L.—**A. calamus**, L.; common.

LEMNACEÆ.

LEMNA, L.—**L. trisulca**, L.; near Brooklyn, *Torr. Cat.;* near Bowery Bay, and New Lots, *Ruger;* Closter, *Austin;* Passaic, &c., not rare.—**L. Valdiviana**, Phillippi (L. Torreyi, *Austin*); Closter, fertile, *Austin;* Patchogue, *Allen* (vid. vol. I, No. 9, § 71).—**L. perpusilla**, Torr.; not rare, along Staten Is. R. R.; Gravesend, L. I.; var. **trinervis**, *Austin*, Pamrapo, Bergen Co., N. J., *W. H. L.*—**L. minor**, L.; not uncommon, particularly abundant near Weehawken, where it usually flowers: var. **obscura**, *Austin;* New Durham? *W. H. L.;* var. **orbiculata**, *Austin.*—**L. polyrrhiza**, L.

(Spirodela); very common; N. Y.; fertile, Staten Is., vid. Vol I. No. 8, § 61, & seqq.

WOLFFIA, Horkel, Schleiden.—W. Columbiana, Karsted; Closter, rare, also Orange Co., *Austin*.

81. Apocynum, *No.* 1.—One of the most charming of our native plants is the *Apocynum androsæmifolum*, L., notwithstanding its long name. The beautiful clusters of rosy bells, with their pink bars and delicate fragrance, claim for it a place in the garden, where, however, we do not meet with it, but on open banks and by the side of roads or cultivated fields. It is well approved, too, by the insect tribe, who are in general much more appreciative judges of color and odor than we are. In Europe, where it is not native, it is cultivated in gardens, and according to Lamarck (*Encyc.* Article, *Apocynum*) is called *gobe-mouche*, which may be rendered *fly-trap*. I translate what he has to say on this subject. "The name *gobe-mouche* has been given to it, because the flies, in their greed of the honeyed juice which is found at the bottom of its flowers, insinuate their trunks by the narrow passage which is found between the small bodies which surround the ovaries, and the ovaries themselves, and when these insects would withdraw their bill, it is found to be held the faster, the more efforts they make to withdraw it. Thus these insects, half buried in the flowers, are caught as in a trap, and perish there without power to escape." Smith, in Rees' Encyc., says more generally and, as we propose to show, more accurately: "If flies alight on this plant they are frequently entangled by the glutinous matter and destroyed. Hence the plant has been called "*Herb a la puce.*" The author of the "Journal of a Naturalist," London, 3d Ed. p. 78, says: "Allured by the honey on the nectary of the expanded blossom, the instant the trunk is protruded to feed on it, the filaments close, and catching the fly by the extremity of its proboscis, detain the poor prisoner writhing in protracted struggles till released by death, a death apparently occasioned by exhaustion alone; the filaments then relax and the body falls to the ground. The plant will at times be dusky from the numbers of imprisoned wretches." The figure this author gives of the anthers is certainly inaccurate, and he represents the anthers as standing apart at the top, a position which they cannot assume. His use of the term *filaments*, too, implies that he had no correct notion of the case. Last summer, while sojourning among the Catskill Mts., I spent hours in watching this plant, but was never so fortunate as to see an insect caught, though there were many traces of them to be found in the shape of lost members, &c. It would seem, therefore, that our native insects are not so readily entrapped.

These are all the authorities I have been able to find on the fertilization of *Apocynaceæ*, excepting always C. K. Sprengel, to whom I may have occasion to refer hereafter. If any of my readers can indicate any other writings elucidating the *modus operandi*, the information would be very gratefully received. W. H. L.

82. **Glen Cove, L. I.** **Trillium erectum**, L., is found in a swamp about three miles east of Glen Cove. I know of no other locality on L. I. **Galium verum**, L., grows just south of Glen Cove. **Stylosanthes elatior**, L., is quite common. **Rhamnus catharticus**, L., is frequently met with in the neighborhood of Oyster Bay village, also on West Neck, north westerly from the village of Huntington, L. I. ISAAC COLES.

83. **West Virginia.**—During a flying visit to the White Sulphur Springs, W. Va., in July last, I discovered a small quantity of *Eriogonum tomentosum*, Mchx., growing on a ledge of rocks about two miles from the Springs. There might have been three hundred plants, nearly all in bud, a few showing their *yellow* flowers. I gathered a score or more and left the rest to multiply. Crossing the Alleghanies by carriage road to the Peaks of Otter, I saw *Clematis Viorna*, L., beautifully in flower and fruit; also large quantities of *Spiræa corymbosa*, Raf., and frequent, high and dry, on the rocks, tall and stout *Melanthium Virginicum*, L. I was unprepared for that, as with us it grows along the margins of marshes, as at Bergen, N. J.

On the very top of the Peak of Otter, in among the immense boulders, is any quantity of *Dicentra eximia*, DC., luxuriant in its growth of leaves, which overtop and conceal the flowers. The flowers were badly eaten by insects, and although it seemed in prime, it was with great difficulty I could secure two or three good specimens; very abundant just there, also, is *Saxifraga erosa*, Pursh, and down the sides of the peak, *Veratrum parviflorum*, Mchx., just beginning to flower. The whole of the loose slender panicles seemed to be ready grown, all in bud, and only waiting for each other to blossom. The amount of *Castanea pumila*, Mchx., down the valley of Virginia to Harpers Ferry is wonderful everywhere; along road sides and in thickets it is the prevailing shrub. At Harpers Ferry, I saw for the first time *Lippia*, growing on the rocks with *Dianthera*, and on the banks *Baptisia alba*, R. Br., and plenty of the *Asimina*. T. F. A.

84. **Sesuvium pentandrum**, Ell.—On the 20th of August last, I again visited East Hampton, L. I., for the purpose of examining the locality of this plant. I found it in very considerable quanties, and procured many specimens from which I shall be happy to supply any of our botanists who may desire it. I think it would be better to collect it in September. I had hoped to determine whether the plant is annual or perennial, but I do not feel certain, though I believe it to be perennial, like the other species, *S. Portulacastrum*, L.

It is now clear that the latter plant, the only species described in our manuals of northern plants, will have to disappear from the next editions of such manuals, and be replaced by *S. pentandrum*, heretofore supposed to be a southern form.

It is probable that *S. Portulacastrum* has never been found north of the Carolinas, at least that species is not to be found from any northern locality, in any herbarium, so far as I am aware, in the country. It is not in that of Dr. Gray, nor in Dr. Torrey's.

September, 1872. J. S. MERRIAM.

85. New Postage Law.—*Partial Regulations under the New Postal Code, 1872. P. O. Department, June* 20, 1872. We have received this pamphlet from Mr. A. H. Curtiss of Virginia. Mr. Curtiss had written to the P. O. Department for information about some stray packages of plants, and received a note from James H. Marr, First Acting Assist. P. M. General, stating that "such packages should be mailed as 3d class mail matter at a pre-paid postage of two cents for each two ounces or fraction thereof," and referring to §§ 133 and 163 of the new Postal Code. Section 133 defines third-class mailable matter, in which are included seeds, cuttings, bulbs, roots, and scions. By the decision of the P. M. General, obtained by Judge Clinton of Buffalo, and recorded in the BULLETIN, Vol. II, No. 3, § 17, "*botanical cuttings*" would come under this head. Section 163 of the New Code gives the rate of postage, "one cent for each two ounces or fraction thereof. Double these rates shall be charged for books, samples of metals, ores, minerals and merchandise prepaid by postage-stamps." Botanical specimens cannot fairly be included in this exception. We suppose that Mr. Marr looked upon them as merchandise, which they in no sense are, we think therefore that upon appeal this decision would be reversed. The packages should be so put up that their contents may be inspected, and there should be no writing, according to law, though there is great inconvenience in sending specimens without a label. The package must not exceed twelve ounces in weight.

86. New Publications.—1. *Sequoia and its History.* There are probably few of our readers who have not by this time read Dr. Gray's Presidential address. The sagacity which long ago detected the similarity in the Floras of the eastern shores of the northern continents and its probable explanation, finds additional evidence in Heer's more recent investigation of the fossil botany of the Arctic zone, and Maximowicz's "admirable collections in Japan and adjacent countries." Dr. Gray's discourse is one of the first essays in what must be in the future a leading department in the science, viz: The History of the Evolution of Vegetable Forms.—2. *Synopsis of New York Uncinulæ*, by Chas. H. Peck, Albany. "The species of this genus [of *Erysiphei*] inhabit the living leaves of trees and shrubs, and make their appearance late in summer or in autumn." "The number of species inhabiting this State is unexpectedly large, seven being now known."

87. Sedges and Grasses.—All who have specimens of these orders, or know of stations, will oblige us by communicating them at an early day. We are in immediate want, also, of reports on *Potamogetons* and the succeeding orders of *Endogens.*

88. New Localities.—Mr. Miller finds *Myrica Gale*, L., abundant at Wading River, and Mr. R. W. Brown reports Aseyrum stans, Mchx., from Keyport, N. J.

Terms—One dollar for one copy; five dollars for seven; and half a dollar forevery additiona copy, per annum.

Local Herbarium, 3, E. 33d St.—Editor, 224, E. 10th St.

The Club meets regularly the last Tuesday of the month in the Herbarium, Columbia College, at 7½ P.M.

89. Apocynum, *No.* 2.—Looking deep down into the bell of *Apocynum androsamifolium* we see what may be likened to a striped conical tent. A more satisfactory view may be had with the aid of a magnifier. This cone is formed by the five anthers meeting in a point: the stripes are the narrow intervals between them. The anthers are shaped like the head of an arrow, but the ends of the barbs are somewhat incurved and conceal the shaft or filament, which is besides bent inward toward the base of the style. This incurving of the base of the anthers makes the lower end of the space or groove between them a little wider than the upper part of the passage and might serve to catch the leg or proboscis of a fly and guide it to the groove. Facing this wider part of the interval, but a little lower, are the sharp triangular projections near the base of the corolla, and beneath, within the filaments, are the five glands or nectaries, probably representing an inner circle of stamens. The pink stripes of the corolla are alternate with its lobes, consequently opposite the stamens; they are sharply defined and form a sort of crown or scale at the junction of the lobes.

On investigating the interior of our conical tent, we find a curious and quite complicated arrangement. In the first place, the lower part or barb of the anther is destitute of pollen. Then, where the filament joins the anther, is a membrane surrounding the middle of the style and uniting it pretty strongly to the stamens, serving at once to hold the anthers in their fixed position, and to screen the base of the style below from the pollen above. The anther consists of two cells, which, when separated below, form what we have called the barbs. Above the insertion of the filament the inner walls of these cells are united into a short column or wall, and further up their edges again become free, and spreading outward nearly meet the edges of the outer walls of their respective cells, so that the slit for the escape of the pollen is almost lateral. Thus the inner side of the anther presents, near the top, the appearance of a smaller two-celled anther within the larger one. We may call this apparent anther *antherion*, or little anther. Just below it, on each side of the column mentioned as formed by the consolidation of the inner cell-walls, are two little pockets, just at the end of the openings for the escape of the pollen in the sides of the *antherion*. These pockets are empty, unless they may contain the cell lining in a somewhat disintegrated form: I am not sure of this point. The upper portion of the cells of the *antherion* are also destitute of pollen, and apparently serve only as a protection for the small portion below them which is really polliniferous. The pollen grain is compounded of four spherules as in Periploca.

The pollen bearing portions of the anther, then, it will be seen, open along the lateral edges, and are separated from the corresponding edges of the adjacent anthers only by a very narrow groove, so that, if a small rough thread be drawn through this groove, the pollen on both sides will be disturbed, that is the pollen in the right hand cell of one anther and the left hand cell of the other. This

arrangement brings to mind the pairs of pollen masses derived similarly from adjacent anthers in the closely allied family of the Asclepiadaceæ.

Just above the membrane or partition wall which divides the upper from the lower portion of the style, the latter is surrounded by five small and very glutinous projections, which abut against that portion of the anther which we called a column and are pressed a little into the pockets, so that, in consequence of the depression made by the column, they present somewhat the appearance of ten little knobs. They thus approach nearly the passage of the pollen on both sides of it, but do not block it up. The upper part of the style is glutinous and imperfectly two-lobed : it would naturally be supposed to be the stigmatic surface. Pollen grains are commonly found on it, whether in course of nature or in consequence of disarrangement by dissection. The lower part of the style, below the dissepiment which screens it from the pollen, is top-shaped and tapers down to the point where it joins the ovaries. The broadest portion is a little lower than the base of the anthers, where the space between them is widest, and would naturally afford a foothold for insects sipping the nectar. The filaments are parallel with the tapering base. I have found grains of pollen also but in less abundance on this broadest portion of the style, where it might have been left by an in sect before drawing its foot or trunk up the groove, as it certainly must do sometimes.

I have found many cases of limbs of insects caught in the grooves between the anthers, and, in one instance, the remaining upper portion of a fly who had there "miserably perished," having been held by his proboscis. On another occasion, I found the pollen mass of an Asclepias caught in the base of the groove. To ascertain if a small object drawn through the groove would bring out the pollen, I availed myself of the hooked styles of a Geum. The hooked end came out with a supply of pollen held together by a glutinous substance, as if it had first brushed the glutinous processes that lie on each side of the entrance to the pollen, and next, coming in contact with the pollen, had brought it out. A few days after I found the mass perfectly solidified. If the limb of an insect were too large to more than brush the glutinous projections, or if this substance had begun to harden, it would be difficult for the insect to escape unmutilated.

The plant is quite fertile, but, nevertheless, the larger portion of the flowers fail to produce pods.

In the present paper I have endeavored to state the facts without offering an explanation, though, in trying to make my description intelligible, I could hardly avoid suggesting one. I do not suppose that I have discovered any new points in the structure of this marvellous flower, but I can not find that the mode of fertilization has yet been interpreted, and propose to offer some suggestions on this subject in a concluding article. W. H. L.

90. **Aquilegia**, Tourn.—A scholar suggests that this word is inex-

plicable as a derivative of *aquila*, eagle, but might be legitimately formed from *aqua*, water, and *lego*, to collect, the spurs being compared to water holders. The explanation in Gray's Manual—"from "*aquila*, an eagle, from some fancied resemblance of the spurs to talons—" is that given by Tournefort, the author of the genus. But Tournefort adds "*as they say*," "*ut aiunt*," showing that he only adopted a name in use. On this subject we have received the following communication. It must be remembered that Tournefort's date is about the year 1700. Our correspondent shows that the word is much older than that, though somewhat different in form. Possibly, as *aquileia*, it is really related to *aquila*. EDS.

I find a somewhat different account in the Herbal of Hieronymus Tragus, (*Anglice*, Jerome Buck) printed in Old German at Strasbourg in 1551. The plant is there called "Agley" and "Aglei," both ways of spelling being employed. A fine cut and accurate description leave no doubt of the identity of the plant; but the author had evidently no idea of the eagle-spurs, or of *aquila*, as, in describing its spurs, he likens them to those of the "Eisenhutlein und Rittersporen" (Monkshood and Larkspur.) Speaking of the name, the author identifies the plant as one sort of *Centaury* spoken of by Dioscorides and other ancient authors, the name *Centaury* having been anciently applied to this, as well as to several sorts of Compositæ, Gentians, Saffron, and other plants. The sort of Centaury to which this plant belonged, however, had two varieties, of which the larger is the Columbine, and was called both Centaureum majus and Centaurea solida, besides numerous other names. The author says it is called by the moderns "Aquileia, Alkaleia, Usi or Osir, [and] Agley, presumably the same as Aegilops." Aigilops is the ancient name of several plants; if we can connect Agley with *aigilips*, (steep, inaccessible, prop. inaccessible to goats,) [or *aigilos*] it would not be a bad name for the plant, considering its love for cliff-sides. But whether *Aquileia* and *Alkaleia* and *Aquilegia* are corruptions of "Agley," or what may be the definition of "Agley" I do not presume to determine.

I. H. HALL, 36 Pine st.

91. **Suffolk County Plants**—I have found in this vicinity during the past season, *Helianthus angustifolius*, L., *Rumex Engelmanni*, Ledeb, *Rhynchospora nitens*, Gray (at Wading River), *Panicum amarum*, Ell.; which I believe are new to Long Island. Of other species, I may mention: *Hottonia inflata*, Ell.; *Arethusa bulbosa*, L.; *Orontium aquaticum*, L.; *Smilacina stellata*, Desf.; *Hypericum adpressum*, Bart.; *Solidago odora*, Ait., *var. inodora*; *Lycopodium inundatum*, L., *var. Bigelovii*, Tuck.; *Eriophorum gracile*, Koch.; *Fimbristylis spadicea*, Vahl., *var. castanea*, Gray; *Andropogon Virginicus*, L., and *A. macrouros*, Michx. I found *Vallisneria spiralis*, L., in a quite swift but shallow stream, which is the outlet of Great Pond S. W. of Riverhead, with leaves only 2 or 3 inches in length.

Prunus Cerasus is thoroughly naturalized with us, the young trees springing up everywhere in hedges and along neglected fence rows.

Chelone glabra, L., I have found with 5 perfect stamens, while other flowers from the same plant exhibited the usual form.

Solidago lanceolata, L., I have found growing in dry soil by the roadsides, while other plants collected from a salt marsh were far more strongly honey-scented and scarcely rough-pubescent except on the margins of the leaves.

Muhlenbergia diffusa, Schreber, I find aping the manners of *M. Mexicana*, Trin., and becoming a weed of gardens, and near buildings.

Panicum proliferum, Lam., too, seems somewhat out of place in company with *P. capillare*, L., in a perfectly dry garden, although it made itself at home there.

Northville, L. I. HENRY W. YOUNG.

92. **Yucca filamentosa**, L.—Our correpondent, J. W. B., writes that, on carefully examining what remain of his capsules of this plant, he finds some of them perforated as described by Dr. Engelmann.

93. **Reassembling of the Club, Oct. 29th.**—Present: Messrs. Torrey, Le Roy, Allen, Bower, Hall, Hogg, Gerard, Leggett, Merriam, McIntyre, Morris, Payne, Redfield, Ruger, Wilber, Wood. Among the visitors were Dr. Newberry and Messrs. Froebel, Neerbach, and T. Hogg. Dr. Torrey and Mr. Redfield had during the summer recess visited the Western part of the Continent. One of the spoils brought back was a gigantic *Pterospora Andromedea*, Nutt., over four feet in height. Dr. Newberry exhibited a fossil *Onoclea*, undistinguishable from *O. sensibilis*, L., with the venation perfectly preserved. This specimen was from the Miocene of the Upper Missouri.

94. **Exchanges.**—Mr. E. S. Miller, Wading River, Suffolk Co., N. Y., wishes to exchange the plants of his region, particularly for North American Ferns.

TYPHACEÆ.

Typha, Tourn.—**T. latifolia**, L. Marshes and pools, *Torr. Cat.* Closter common, *Austin;* Glen Cove, *Coles;* Westchester Co., *Pooley Le Roy.*—**T. angustifolia**, L.; similar situations, *Torr. Cat.; Austin; Pooley;* I have never been able to satisfy myself that we have two species: the usual form in this vicinity answers to T. angustifolia, and is quite common. *W. H. L.* Vid. *State Flora.*

Sparganium, Tourn.—**S. eurycarpum**, Engelm.; Closter, common, *Austin*; Pleasant Valley, *W. H. L.;* in ditches and small streams, *Torr. Cat.*—**S. simplex**, Hudson: Var. **Nuttallii**; Wading River, L. I. Var.-**androcladum**; is apparently the prevailing form on and about the Island of New York.

NAIADACEÆ.

Naias, L.—**N. flexilis**, Rostk.; rather common; Hackensack River, *Austin;* Flushing, *W. H. L.*

Zannichellia, Micheli.—**Z. palustris**, L.; Allerton's 1861, *Austin;* ditches, New Durham, *Austin;* Var. **pedunculata**; Flushing, *W. H. L.*

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ZOSTERA, L.—Z. marina, L.; common; in fruit, Easthampton, Suffolk, Co., *T. F. Allen.*

RUPPIA, L.—R. maritima, L.; common; Spuyten Duyvel, *Le Roy*; on the bank of a brook near Chester, Morris Co., N. J., 1854, *Austin.*

POTAMOGETON, Tourn.—P. natans, L.; common.—P. Oakesianus, Robbins, Peekskill, *Le Roy.*—P. hybridus, Mchx.; waters of the Hackensack, *Austin*; Staten Island, Silver Lake, *W. H. L.*; Wading River, *Miller.*—P. amplifolius, Tuckerman; probably not uncommon; Lake Mohegan, *W. H. L.*—P. gramineus, L.; waters of the Hackensack, *Austin*; Var. graminifolius, Fries; Jamaica, *W. H. L.*—P. lucens, L.; waters of the Hackensack, *Austin*; In creeks, *Torr. Cat.*—P. praelongus, Wulfen; Piermont, *Austin.*—P. perfoliatus, L.; common; Hackensack creeks.—P. crispus, L.; common in Morris Co., and at Piermont, N. J., *Austin;* Passaic, *W. H. L.*—P. compressus, L.; waters of the Hackensack, *Austin.*—P. pauciflorus, Pursh; "In the Passaic River and elsewhere," *Torr. Cat.*; waters of the Hackensack, *Austin.*—P. pusillus, L.; Hackensack and creeks, *W. H. L., Austin*; Train's Meadow, *Ruger.*—P. pectinatus, L.; "Salt water ditches and shallow bays, near New York, and on Long Island." *State Flora*;—waters of the Hackensack, *Austin.*—P. Robbinsii, Oakes, waters of the Hackensack, *Austin.*

ALISMACEÆ.

TRIGLOCHIN, L.—T. palustre, L.; *Gray's Manual?*—T. maritimum, L.; New York Island, *Torr. Cat.*; shores of Long Island.

ALISMA, L.—A. Plantago, L.: Var. Americanum; common; N. Y.

SAGITTARIA, L.—S. variabilis, Engelm.: common, with most of the varieties; N. Y.—S. calycina, Engelm.; English Neighborhood, *Austin*; Peekskill, *W. H. L.*: Var. spongiosa; Peekskill, *W. H. L.*—S. heterophylla, Pursh; Peekskill, *W. H. L.?*—S. graminea, Mchx.; Jamaica, Flushing, *W. H. L.*—S. pusilla, Nutt.; Hackensack streams, *Torr. Cat.*; English Neighborhood, *Austin*; Passaic, *W. H. L.*; East New York, and Jamaica R. R., *Ruger.*

HYDROCHARIDACEÆ.

ANACHARIS, Richard.—A. Canadensis, Planchon; common. Vid. § 26.

VALLISNERIA, Micheli.—V. spiralis, L., common, particularly in the waters of the Hackensack and Passaic.

95. Apocynum, *No.* 3.—Before proceeding it is necessary to make some explanations in reference to the statements in the previous article. The empty space in the upper part of the anther is really between the cells of what I called the *antherion* and an outer coat of the whole anther, which coat is prolonged into a point upward, and these points meeting serve, I presume, to shield the parts of the flower within from the weather. Again, the wider part of the base of the style is not so low down as the base of the anthers, but about half way between that and the dissepiment or partition between the upper and lower parts of the style. In speaking of the cell walls of the anther, I used the term generally, for convenience of descrip-

tion, not having made a special investigation of what parts of the anther are really represented by the column and other processes. The very curious diaphragm which separates the two portions of the style is five-lobed, in consequence of a slight depression between the anthers, where, we may suppose, if fully developed, it would obstruct the passage of an insect's proboscis through the groove; its lobes are in consequence opposite the anthers. From the middle line of these lobes the glutinous secretions or glands arise, as may be seen more distinctly in the bud. They are, in this stage of the flower, in the form of an inverted arrow head, the point being on the lobes just mentioned, and the barbs rising obliquely towards the openings for the pollen. These barbs mature into the glutinous masses, one from different pairs being on either side of the groove. The upper part of the style, commonly considered the stigmatic surface, and which is furnished with the glutinous processes, is of a firmer consistency than the lower part, and, though pollen is often found on it under dissection, I have never found this pollen putting forth tubes. The part below the dissepiment is of a much looser texture, consisting mainly of curious oblong cells. Attached to the outside of this, just below the dissepiment, may often be found masses of pollen agglutinated together and protruding tubes in profusion, one tube from each of the four spherules of which the grain is composed. These would be interesting objects for a microscopist. The tubes are parallel and very different in other respects, but, nevertheless, the object reminded me of the spores of Equisetum.

Robert Brown, it is well known, showed that this is the portion of the style in Asclepias that is truly stigmatic, and succeeded in tracing the tubes to the ovaries, the placentæ, and finally the ovula. I have not succeeded in following them, far from it; but I think it is clear that this is the true stigmatic surface in Apocynum also. The fly probably dips its head down to get at the nectaries in the bottom of the cup, and, in drawing it back, sometimes gets its proboscis caught in the groove between the anthers, to which it is guided by their diverging bases. As the proboscis is drawn up the groove it passes the glutinous glands, which are easily detached when the flower is mature, and, being thus charged with one or both of these glands, draws out the pollen from one or both of the adjacent anther cells. Perhaps, alarmed by this rude entertainment, the insect flies off to a more distant flower, where it goes through the same process, first, however, leaving the stranger pollen on the stigmatic surface. Or it may, perhaps, sip about the same bush, and being put on its guard, not be at once caught again in the same trap. However this may be, it is evident that the whole wonderful contrivance is to prevent self-fertilization. Observers are mainly indebted to Mr. Darwin for calling their attention to what proves to be a very general and most curiously varied arrangement in flowers to this one end. I might have mentioned that, where the filaments bend closely along the base of the style, they are provided with hairs; whether, as Sprengel would suggest, to protect the nectaries from

rain, or whether to help the fly free itself from its incumbrance, or for both objects, is matter for conjecture.

This position of the stigmatic surface adds another to the many points of analogy between Apocynareæ and Asclepiadaceæ. There is, likewise, a wonderful resemblance in their mode of fertilization, at least, in the typical genera. If in any period of their history these quadruplex pollen grains of Apocynum should be massed together, and these upward pointing glands should reach and become agglutinated to the pollen masses, Apocynum would have to be classed with Asclepiads—with that section which has the glands below the pollen masses. It may be, as in the case of Orchids, that these similar contrivances have arisen independently; or it may be that Apocynum belongs to an ancestral stock from which the more perfectly specialized Asclepiad has branched off. It is even possible that the former is a degenerate descendant of the latter. Much depends upon the history of the peculiar glands of the stigma. I do not know that their origin has ever been accounted for in Asclepias. Brown in a masterly manner traced them from their first appearance as a furrow in the style, and perhaps nothing more can be done. In the more varied forms of Apocynaceæ, however, which seem to be the link between ordinary flowers and that very distinct tribe, it may be possible to trace them still further. One consideration persents itself forcibly in studying the structure of this flower, that is the multiplied series of organs, nine circles in all: 1, the five lobes of the calyx; 2, alternate with these the five lobes of the corolla; 3, alternate with these the five pink stripes forming a slight crown above; 4, again alternating, the five triangular processes at the base of the lobes of the corolla; 5, alternating with these, or, taking no account of these, with the divisions of the corolla, the five stamens; 6, of course alternating, the five nectaries; 7, the diaphragm; 8, the glands; 9, the bilobed style. The glands seem to be opposite the anthers, as are the lobes of the diaphragm also. What morphological value the most of these circles may possess, A. de Candolle has discussed (Ann. Sci. Nat., 3d Series, Bot., Vol. 1). He considers the diaphragm an extension of the filaments, but makes no mention of the glands. But these and other questions it is not my present purpose to pursue.

Two points, new perhaps, I think I have established—the position of the true stigma, and the mode of fertilization. W. H. L.

96. ARCEUTHOBIUM shedding its seed. — I visited the swamp in Warrensburg, the first week in October. I found the female plants of Arceuthobium nearly all gone; every effort that I made to cut twigs from the matted clumps, where the colonies of these strange parasites grow, brought them down in showers. Fearing that I should fail to get plants with full seed vessels, I picked a single plant with vessels very much swollen. While holding it gently between my thumb and finger, to observe it more closely, I felt the tiniest recoil of the capsule, and the seed struck me a smart blow in the face. I gathered another, and another, and each pretty little

bomb went off with a force that must have carried it several feet away.

The seed flies out of the base of the capsule, instead of the top, but its position on the plant makes that the top, as when ripe, the vessels hang with the true summit turned downward.

I found the seeds and empty seed vessels lodged all about on the branches. The plants which have ripened seed, fall off nearly together, those which have not blossomed, or have failed to be fertilized, probably remain for another year. When the seeds are being sown, there must be quite a brisk bombardment going on for several days. Isolated colonies of Arceuthobium in forests may have been planted by seed adhering to the feet of birds. L. A. M.

97. **Suffolk County Plants.**—I have found the following plants about, here this summer, *Sarracenia purpurea*, L., at River Head, *Arabis perfoliata*, Lam., and *Camelina sativa*, Crantz., a single plant of each. *Reseda* Luteola, L., roadside, Mt. Sinai, L. I. with *Mentha aquatica* L., Var. *crispa*, Benth. *Hudsonia ericoides*, L. grows plentifully at Baiting Hollow; *Drosera filiformis*, Raf., common, *Hypericum Canadense* L. Var. *major*, Gray, at Long Pond, Wading River, and Edward's Pond, Middle Island.—*Saginia procumbens*, L., very common. *Polygala cruciata*, L., and *P. Nuttallii*, Torr. & Gray, are both common.—*Desmodium laevigatum*, DC., at Manor Station, L. I. R. R.—*Phaseolus helvolus*, L. common, *Galactia mollis*, Mchx., I found one clump of at Long Pond.—*Prunus Americana*, Marshall, I have only met once.—*Aster spectabilis*, Ait., and *A. concolor*, L., both common. *Gnaphalium purpureum*, L., common.—*Pyrola chlorantha*, Swartz, very common in the pine woods.—*Utricularia minor*, L., and *U. intermedia*, Hayne, both growing in a pool together. I notice that these flower in May and the early part of June, while *U. purpurea*, Watt., *U. resupinata*, Greene, *U. inflata*, Watt., *U. gibba*, L., *U. vulgaris*, L., *U. cornuta*, Mchx., and *U. striata*, Le Conte, do not flower until August. I find them all here. *Polygonum Careyi*, Olney, at Long Pond and *P. ramosissimum*, Mchx., borders of salt meadows.—*Sagittaria calycina*, Engelm., Var. *spongiosa*, which I reported last year, proves to be *S. graminea*, Mchx.—*Arethusa bulbosa*, L., common at River Head and Manor.—*Cyperus erythrorrhizos*, Muhl., grows plentifully at Edward's Pond, Middle Island.—*Scirpus subterminalis*, Torr., grows at Deep Pond, Wading River.—*Rhyncospora nitens*, Gray, grows plentifully at Long Pond, with the typical form of *R. macrostachya*, Torr., the one I reported last year was the *diffuse variety*.—*Juncus pelocorpus*, E. Meyer, grows very plentifully here.—*Sporobolus serotinus*, Gray, is very common at River Head.—*Botrychium simplex*, Hitch. sparingly at River Head.

Wading River, Dec. 5th, 1872. ELIHU S. MILLER.

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